

Table 2-1
Summary of Studies Used in the RI

Title	Date	Author	Description
Site-specific Studies Included in RI Database			
Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure, Greenpoint Energy Center	2009 – 2010	GEI Consultants	National Grid In-creek Surface Sediment, Subsurface Sediment
Phase 1 Remedial Investigation Interim Data Report – Newtown Creek RI/FS	June 2012	Anchor QEA	Hydrographic Surveys (Bathymetric, Sonar, and Magnetometer)
			Aerial Photography Survey
			Shoreline Survey
			Opportunistic Sampling
			Submerged Utilities
Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1 – Newtown Creek RI/FS	January 2013	Anchor QEA	Shoreline Survey
			Opportunistic Water
			Current Meters (2/2012 – 6/2012)
			Tidal Survey (2/2012 – 6/2012)
			Surface Water (2/2012 – 6/2012)
			Sedflume
			Surface Sediment (Event 1)
			Air
			Habitat Survey
			Benthic (Spring 2012)
			Fish Community
			LiDAR
			Aerial Imagery
Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 2 – Newtown Creek RI/FS	April 2013	Anchor QEA	TIR
			Current Meters (7/2012 – 1/2013)
			Surface Water (7/2012 – 8/2012)
			Surface Sediment (Event 2 and Phase 1 Reference Areas)
			Subsurface Sediment and Native Material
Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3 – Newtown Creek RI/FS	July 2013	Anchor QEA	Benthic (Summer 2012)
			Current Meters (1/2013 – 3/2013)
			Surface Water (9/2012 – 1/2013)
			Post-Sandy Surface Sediment
			Subsurface Sediment and Native Material (Additional Results)
			Post-Sandy Bathymetry
Phase 2 Remedial Investigation Field Program Data Summary Report – Newtown Creek RI/FS	November 2016	Anchor QEA	Phase 1 Reference Areas (Additional Results)
			Surface Water
			Surface Water during Point Source Discharge
			Current Meters
			Continuous Surface Water Monitoring
			Surface Sediment
			Benthic
			Metals Speciation
			Subsurface Sediment and Native Material
			In-creek Sediment Traps
			Tissue
			Fish and Crab Community Survey
			Caged Bivalves
			Habitat and Wildlife Survey
			Groundwater
			Porewater
Point Sources			
Gas Ebullition			
Hydrogeology			
Additional Studies			
Surface Water Elevation Data	1994 – 2013	NOAA	Tidal Elevations
New York Harbor Water Sampling Program	2008 – 2016	NYCDEP	Water Sampling throughout New York City Waterways (June – September)
CARP	1990 – present	CARP	Sediment, Surface Water, Tissue
NYSDEC	1990 – present	NYSDEC	Tissue
Con Edison East 21st Street Study	2007, 2008, 2010	RETEC, ENSR/AECOM, AECOM	Sediment
Fish tracking study of Gahagan et al. (2015)	2015	Gahagan et al.	Striped Bass Migration Information
Regional Ambient Air Quality Data	2006 – 2011	NYSDEC	Ambient Air Background

Table 2-1
Summary of Studies Used in the RI

Note:
Phase 2 Data Summary Report does not list all individual programs and generally lists programs by media. See Phase 2 DSR for complete list of programs.

Acronyms:	
CARP = Contamination Assessment & Reduction Project	NYSDEC = New York State Department of Environmental Conservation
ENSR = ENSR International Corporation	RETEC = The RETEC Group, Inc.
GEI = Geotechnical Engineers, Inc.	RI = Remedial Investigation
LiDAR = Light Detection and Ranging	RI/FS = Remedial Investigation/Feasibility Study
NOAA = National Oceanic and Atmospheric Administration	TIR = thermal infrared
NYCDEP = New York City Department of Environmental Protection	

References:

Anchor QEA, 2012. *Phase 1 Remedial Investigation Interim Data Report*. Newtown Creek Remedial Investigation/Feasibility Study. June 2012.

Anchor QEA, 2013a. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1*. Remedial Investigation/Feasibility Study, Newtown Creek.

Anchor QEA, 2013b. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 2*. Remedial Investigation/Feasibility Study, Newtown Creek.

Anchor QEA, 2013c. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3*. Remedial Investigation/Feasibility Study, Newtown Creek.

Gahagan et al. (Gahagan, B.I., D.A. Fox, and D.H. Secor), 2015. Partial Migration of Striped Bass: Revisiting the Contingent Hypothesis. *Marine Ecology Progress Series* 525:185-97.

GEI (GEI Consultants, Inc.), 2009a. *Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure, Greenpoint Energy Center*. Prepared for National Grid. January 9, 2009.

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Table 2-2a
Summary of RI Study Data by Media – Physical Surveys

Program	Location	Study	Collection Date	Description and Rationale/DQO	DQO Met	Reference
Phase 1	Study Area	Bathymetry survey	October and November 2011	Single beam survey used to provide information for sampling activities, establish bottom topography and depths for modeling, assist in the evaluation of sediment depositional history, evaluate scour/deposition, and identify the location and size of sediment mounds and deltas at outfalls	Yes	IDR
		Bathymetry survey	December 2012	Single and multi-beam survey collected throughout the Study Area to compare with previous data to evaluate the potential impacts of Hurricane Sandy	Yes	Phase 1 DSR 3
		Side-scan sonar	October and November 2011	Locate obstacles or other impediments that may require refining sample locations	Yes	IDR
		Magnetometer survey	October and November 2011	Magnetometer survey data collected to differentiate metallic debris from other large surface debris identified during the side-scan sonar survey, to identify large buried metallic debris not visible from the side-scan sonar survey, and to potentially locate buried utility crossings	Yes	IDR
Phase 1	Study Area	Shoreline surveys	October and November 2011	Boat-based survey identifying shoreline conditions, structures, potential sources for opportunistic sampling, human activities, and wildlife	Yes	IDR
Phase 1	Study Area	LiDAR	March 2012	Aerial survey conducted during low tide to collect topographical information to be combined with bathymetry to create a seamless digital elevation model	Yes	Phase 1 DSR 1
Phase 1	Study Area	High-resolution aerial imagery	March 2012	Aerial survey conducted concurrently with LiDAR to document the physical characteristics of the shoreline	Yes	Phase 1 DSR 1
Phase 1	Study Area	Thermal infrared imagery	August 2012	Aerial survey of surface water temperatures conducted to identify areas of potential groundwater discharge	Yes	Phase 1 DSR 1
Phase 1	Study Area	Wet-weather surveys	December 2012 to June 2013	Boat-based survey to document locations of point and other non-point source discharges to the Study Area during or immediately following precipitation events	Yes	SSAM

Acronyms:

DSR = Data Summary Report

LiDAR = Light Detection and Ranging

IDR = Interim Data Report

SSAM = Sources Sampling Approach Memorandum

References:

Anchor QEA, 2012. *Phase 1 Remedial Investigation Interim Data Report*. Newtown Creek Remedial Investigation/Feasibility Study. June 2012.

Anchor QEA, 2013. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1*. Newtown Creek Remedial Investigation/Feasibility Study. January 2013.

Anchor QEA, 2013. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3*. Newtown Creek Remedial Investigation/Feasibility Study. July 2013.

Table 2-2b
Summary of RI Study Data by Media – Sediment Surveys

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 1	Study Area	Surface Sediment	Surface Sediment Analytical Chemistry – Event 1 ²	April to May 2012	124	124	Surface sediment grab samples collocated with benthic community surveys and subsurface sediment cores to characterize the physical properties and chemical nature of surface sediments, provide information for the risk assessments, characterize the potential for future natural recovery, and support the evaluation of potential remedial alternatives	Yes	Metals, PAHs, VOCs, SVOCs, pesticides, chlorinated herbicides, PCB Aroclors, TOC, ammonia as nitrogen, cyanide, phosphorus, pH, nitrogen, soot carbon, sulfide, grain size, and dry density Subset of samples (25% of samples): Atterberg limits, specific gravity, and moisture content Subset of samples (25% of samples): dioxin/furans, high-resolution organochlorine pesticides, PCB congeners, and methyl mercury Subset of samples (15% of samples): Be-7	Phase 1 DSR 1
	Study Area		Work Plan Addendum	July 2012	6	6	Surface sediment grab samples collocated with subsurface sediment cores to address data gaps identified during the historical data review	Yes	Metals, PAHs, VOCs, SVOCs, pesticides, chlorinated herbicides, PCB Aroclors, TOC, ammonia as nitrogen, cyanide, phosphorus, pH, nitrogen, soot carbon, sulfide, grain size, and dry density	Phase 1 DSR 1
	Study Area		Surface Sediment Analytical Chemistry – Event 2	August 2012	34	34	Surface sediment grab samples collocated with benthic community surveys to characterize chemical and physical properties during lower DO level conditions	Yes	Percent solids, TOC, ammonia as nitrogen, sulfides, iron, manganese, and grain size	Phase 1 DSR 2
	Phase 1 reference areas		Surface Sediment Analytical Chemistry - Phase 1 Reference Areas	October 2012	103	103	Surface sediment grab samples were collected from 14 Phase 1 reference areas to characterize the chemical and physical nature of surface sediment	Yes	Metals, PAHs, SVOCs, herbicides, PCB Aroclors, n-alkanes/isoprenoids, TOC, ammonia as nitrogen, cyanide, phosphorus, pH, nitrogen, soot carbon, sulfide, grain size, and dry density Subset of samples (25% of samples): high-resolution pesticides	Phase 1 DSR 2
	Study Area		Post-Hurricane Sandy Surface Sediment	February 2013	27	27	Surface sediment grab samples were collected to evaluate post-Hurricane Sandy sediment properties including a comparison with Phase 1 RI data	Yes	TOC, TS, and grain size	Phase 1 DSR 3
Phase 2	Study Area and Phase 2 reference areas	Surface Sediment	Surface Sediment Quality Triad	May to June 2014	36 Study Area; 24 Phase 2 reference area	36 Study Area; 24 Phase 2 reference area	Surface sediment grab samples were collected coincident with porewater sampling and surface water quality sampling. Surface sediment grab samples used for toxicity testing, porewater sampling, and benthic community analysis, to evaluate the concentration-response relationship for benthic macroinvertebrates and bioavailability	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, bulk density, and AVS/SEM Subset of samples (nine Study Area samples): metals speciation	Appendix B: Phase 2 DSR
	Study Area		Bioaccumulation	May to June 2014	13	40	Surface sediment grab samples were collected at a subset of the sediment quality triad stations for laboratory-based bioaccumulation testing to evaluate the concentration-response relationship for benthic invertebrates, bioavailability, and bioaccumulation	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR

Table 2-2b
Summary of RI Study Data by Media – Sediment Surveys

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area and Phase 2 reference areas	Surface Sediment	Additional Benthic Community	May to June 2014; August 2014	28 Study Area; 8 Phase 2 reference area	56 Study Area; 16 Phase 2 reference area	Surface sediment grab samples were collected coincident with benthic community surveys and surface water quality sampling in support of the wildlife assessment and to further evaluate the benthic community in English Kills	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, bulk density, and AVS/SEM	Appendix B: Phase 2 DSR
	Study Area		Point Sources	June 2014	27	27	Surface sediment grab samples were collected adjacent to point sources in order to further characterize subarea habitats and to be paired with surface water sampling to determine chemical concentrations and TSS during episodic point discharge events to support fate and transport modeling	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Occupational Exposure	May and June 2014	8	8	Surface sediment grab samples were collected in nearshore areas to further characterize potential occupational exposure	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Sediment Mound	May and June 2014	4	4	Surface sediment grab samples were collected in sediment mound areas to further characterize subarea habitats and to support fate and transport modeling	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Additional Nearshore	June 2014	23	23	Surface sediment grab samples were collected in nearshore areas to further characterize potential ecological exposure to intertidal areas for wildlife	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Additional BHHRA Nearshore	June 2014	15	15	Surface sediment grab samples were collected in nearshore areas to further characterize potential human health exposure	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Confirmation of Contaminant Distribution	June 2014	16	16	Surface sediment grab samples were collected to further evaluate chemical concentrations in English Kills and the Turning Basin of Newtown Creek to confirm contaminant distributions	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR

Table 2-2b
Summary of RI Study Data by Media – Sediment Surveys

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area	Surface Sediment	NYC Post Dredge Areas Sediment Sampling	June to July 2014	10	11	Sediment cores were collected to provide updated information on soft sediment concentrations and compare contaminant concentrations with those measured during Phase 1 for use in the chemical fate and transport model	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Groundwater Program – Surface Sediment	October 2014	17	17	Surface sediment was collected by piston core collocated with porewater sampling to provide supporting information for evaluation of sources to the Study Area at the groundwater/surface water interface	Yes	VOCs, SVOCs, PAHs and alkylated PAHs, mercury, dioxins/furans, PCB congeners, aliphatic and aromatic TPH, metals, total cyanide, pesticides, TOC, soot carbon, bulk density, dry density, MC, TS, and pH	Appendix B: Phase 2 DSR
National Grid	Turning Basin		Pre-Design and Supplemental Pre-Design Investigations	2009 – 2010	31	31	Surface sediment samples were collected to evaluate the presence of NAPL adjacent to the property and assess native material depths	Yes	VOCs, SVOCs, metals, pesticides, PCB Aroclors, herbicides, dioxin/furans, methyl mercury, ammonia as nitrogen, cyanide, nitrogen, phosphorus, sulfide, TOC, soot carbon, TS, and pH	Greenpoint Energy Center Former Manufactured Gas Plant Site Work Plans
Phase 1	Study Area	Subsurface Sediment and Native Material	Subsurface Sediment	May to July 2012	98	524	Subsurface sediment and native material cores were collected to characterize the physical properties, chemical nature, thickness, and volume of sediments; characterize the vertical distribution and depositional time history of constituents within the sediment profile and the potential for future natural recovery; and inform potential remedial alternatives including sediment volumes	Yes	SVOCs, chlorinated herbicides, PCB Aroclors, metals, mercury, PAHs and alkylated PAHs, n-alkanes and isoprenoids, TOC, soot carbon, ammonia as nitrogen, sulfide, nitrogen, phosphorus, cyanide, pH, nitrate/nitrite, grain size, dry density, and pesticides 25 select chemistry cores: VOCs, dioxin/furans, high-resolution pesticides, PCB congeners, and methyl mercury 10 geotechnical cores: Atterberg limits, specific gravity, and moisture content 17 geochronology cores: Cs-137 and Pb-210	Phase 1 DSR 2
Phase 2	Study Area		High-Resolution Sample Intervals	June to July 2014	12	84	Short cores were collected in small sample depth increments to provide an assessment of near-surface vertical gradients in chemical concentrations	Yes	PAHs and alkylated PAHs, PCB congeners, metals, TS, soot carbon, TOC, and Pb-210	Appendix B: Phase 2 DSR
	Study Area		Geochronology and Chemistry Sediment Sampling – Group A	June to July 2014	10	246	Geochronology cores were collected to supplement Phase 1 data within the main channel to fill data gaps including further refinement of net sedimentation rates over long-term, multi-year periods	Yes	Cs-137, Pb-210, TS, and TOC	Appendix B: Phase 2 DSR

Table 2-2b
Summary of RI Study Data by Media – Sediment Surveys

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area	Subsurface Sediment and Native Material	Geochronology and Chemistry Sediment Sampling – Group B	June to July 2014	4	138	Chemistry and geochronology soft sediment samples were collected to characterize the vertical distribution and depositional time history of sediment and constituents in areas with potential higher net sedimentation rates	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density Cs-137, Pb-210, TS, and TOC	Appendix B: Phase 2 DSR
Phase 2	Study Area	Subsurface Sediment and Native Material	NYC Post Dredge Areas Sediment Sampling	June to July 2014	10	5	Sediment cores were collected to provide updated information on soft sediment concentrations and compare contaminant concentrations with those measured during Phase 1 for use in the chemical fate and transport model	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Vertical Extent of Contamination	September 2014	1	1	One sample was collected in native material to fill a Phase 1 data gap regarding vertical extent of contamination	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, soot carbon, TOC, TS, dioxin/furans, pesticides, methyl mercury, dry density, and bulk density	Appendix B: Phase 2 DSR
	English Kills		Refinement of Vertical Contaminant Distribution	June to July 2014	3	--	Archive cores were processed to better understand the distribution of contaminants immediately above and below the sediment/native material interface	Yes	Visual observations only	Appendix B: Phase 2 DSR
	Study Area		Confirmation of Contaminant Distribution in Unique Areas	June to July 2014	16	78	Sediment and native material cores were collected to further evaluate chemical concentrations in English Kills and the Turning Basin of Newtown Creek to confirm contaminant distributions	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, total phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, grain size, dry density, and bulk density	Appendix B: Phase 2 DSR
	Study Area		Groundwater Program – Subsurface Sediment	October 2014	17	17	Mid-depth subsurface sediment samples were collected coincident with porewater sampling to provide supporting information for evaluation of sources to the Study Area at the groundwater/surface water interface	Yes	VOCs, SVOCs, PAHs and alkylated PAHs, mercury, dioxin/furans, PCB congeners, aliphatic and aromatic TPH, metals, total cyanide, pesticides, TOC, soot carbon, dry density, bulk density, MC, TS, and pH	Appendix B: Phase 2 DSR
	Study Area		Confirmation and Delineation of NAPL	July 2014; January, August, November 2015	20	--	Subsurface sediment and native material cores were collected for visual observation of NAPL in English Kills and the main stem of Newtown Creek	Yes	Visual observations only	Appendix B: Phase 2 DSR
	Study Area		Metals Speciation	September 2014	5	35	Metals speciation was conducted on Phase 1 core archives to support risk analysis and bioavailability evaluations	Yes	Metals speciation	Appendix B: Phase 2 DSR

Table 2-2b
Summary of RI Study Data by Media – Sediment Surveys

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area	Subsurface Sediment and Native Material	Native Material and Groundwater	June to December 2014	65	65	Native material samples were collected coincident with groundwater to estimate groundwater discharge and groundwater COPC mass load to the Study Area	Yes	VOCs, SVOCs, PAHs and alkylated PAHs, PCB congeners, metals, cyanide, pesticides, dioxin/furans, extractable and volatile petroleum hydrocarbons, total organic carbon, cyanide, pH, soot carbon, dry density, bulk density, moisture content, and TS	Appendix B: Phase 2 DSR
National Grid	Turning Basin	Subsurface Sediment and Native Material	Pre-Design and Supplemental Pre-Design Investigations	2009 – 2010	42	196	Surface sediment samples were collected to evaluate the presence of NAPL adjacent to the property and assess native material depths	Yes	VOCs, SVOCs, metals, pesticides, PCB Aroclors, herbicides, dioxin/furans, methyl mercury, ammonia as nitrogen, cyanide, nitrogen, phosphorus, sulfide, TOC, soot carbon, TS, and pH	Greenpoint Energy Center Former Manufactured Gas Plant Site Work Plans
Phase 2	Turning Basin	Sediment Traps	In-Creek Sediment Traps	2009 – 2010	30	134 (physical), 87 (chemistry)	Sediment traps were installed in the Study Area for a 9-month period and checked monthly to allow for the assessment of seasonal changes in sediment composition and gross deposition fluxes	Yes	SVOCs, PAHs and alkylated PAHs, EPH/VPH, n-alkanes and isoprenoids, triterpenes and steranes, metals, mercury, total cyanide, ammonia as nitrogen, TKN, nitrate/nitrite, pH, phosphorous, sulfide, soot carbon, TOC, TS, PCB congeners, dioxin/furans, pesticides, methyl mercury, and grain size	Appendix B: Phase 2 DSR
Phase 1	Study Area	Sedflume	Sedflume	March 2012	5	24	Erosion rate data were collected to evaluate sediment stability and support development of the sediment transport model	Yes	Erosion rates in relation to shear stress and depth	Phase 1 DSR 1

Notes:

- 1 = Numbers are approximate and may vary depending on how quality assurance samples were counted.
2 = Three samples originally collected as part of the Phase 1 surface sediment sampling program (NC003SG, NC012SG, and WC003SG) are not included in the RI due to being located in areas that have been dredged since the sampling event.
-- = no data

Acronyms:

AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHHRA = Baseline Human Health Risk Assessment
DO = dissolved oxygen
DSR = Data Summary Report
EPH = extractable petroleum hydrocarbon
MC = moisture content

NAPL = nonaqueous phase liquid
NYC = New York City
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RI = Remedial Investigation
SVOC = semivolatile organic compound

TKN = total Kjeldahl nitrogen
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TS = total solids
VOC = volatile organic compound
VPH = volatile petroleum hydrocarbon

References:

Anchor QEA, 2013a. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1.* Remedial Investigation/Feasibility Study, Newtown Creek. January 2013.
Anchor QEA, 2013b. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 2.* Remedial Investigation/Feasibility Study, Newtown Creek. April 2013.
Anchor QEA, 2013c. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3.* Remedial Investigation/Feasibility Study, Newtown Creek. July 2013.
Anchor QEA, 2016. *Phase 2 Remedial Investigation Field Program Data Summary Report.* Remedial Investigation/ Feasibility Study, Newtown Creek. In preparation.
GEI (GEI Consultants, Inc.), 2009a. *Pre-Design Investigation Work Plan – Cutoff Wall Interim Remedial Measure, Greenpoint Energy Center.* Prepared for National Grid. January 9, 2009.
GEI (GEI Consultants, Inc.), 2009b. *Supplemental Pre-Design Investigation Work Plan - Cutoff Wall Interim Remedial Measure, Greenpoint Energy Center.* Prepared for National Grid. April 8, 2010.

Table 2-2c
Summary of RI Study Data by Media – Water

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 1	Study Area	Surface Water Sampling and Water Quality Profiling	Analytical Chemistry Sampling and Water Column Profiling	February 2012 to January 2013	16	345	Surface water samples were collected from multiple depths, and water quality profiles were conducted on a monthly basis to understand the current physical and chemical conditions of Study Area surface water and develop a complete CSM	Yes	Conventional, coliforms, total and dissolved metals, SVOCs, VOCs, PCBs, pesticides, herbicides, TPH, DO, temperature, conductivity, salinity, pH, and turbidity	Phase 1 DSR 3
	Study Area		Ecological Surface Water Analytical Chemistry and Water Column Profiling	April to May 2012, August 2012	34	68	Surface water samples were collected from above the mudline, and water quality profiles were conducted coincident with benthic community surveys to evaluate the condition of the benthic community and to provide data for the ecological risk assessment	Yes	Ammonia as nitrogen, total and dissolved nitrate + nitrite as nitrogen, total and dissolved nitrogen (Kjeldahl), POC, total and dissolved phosphorus, TOC, TSS, DOC, TDS, DO, temperature, salinity, conductivity, pH, and turbidity	Phase 1 DSR 3
	Study Area		Fish and Crab Community Survey Water Quality Profiling	April and August 2012	5	--	Water quality profiling was conducted coincident with fish and crab community survey activities to understand fish use in Newtown Creek and its tributaries	Yes	Temperature, salinity, DO, turbidity, pH, and conductivity	Phase 1 DSR 1
	Phase 1 reference areas		Phase 1 Reference Area Water Column Profiling	October 2012	103	--	Water quality profiling was conducted coincident with surface sediment sampling to provide data to adequately characterize the Phase 1 reference areas	Yes	Temperature, salinity, DO, turbidity, pH, and conductivity	Phase 1 DSR 2
	Study Area		Surface Water TSS	2012 to 2013	5	132	Surface water samples were collected coincident with current meter deployment for calibration	Yes	TSS	Phase 1 DSR 2
	Study Area		Tidal Survey	July 2012	3	--	Water quality profiling was conducted to characterize water quality variations over a tidal cycle to support the hydrodynamic model and better understand circulation patterns	Yes	Temperature, salinity, DO, turbidity, pH, and conductivity	Phase 1 DSR 1
Phase 2	Study Area and Phase 2 reference areas		Risk Surface Water Sampling and Water Quality Profiling	May and August 2014	8 Study Area, 8 Phase 2 reference area	27 Study Area, 31 Phase 2 reference area	Surface water samples were collected from multiple depths, and water quality profiling was conducted to support exposure assessment in the BERA and BHHRA including an increase in spatial coverage at stations where public access and potential exposures may occur. These samples additionally provided synoptic measurements in the Study Area and reference areas to evaluate direct exposure to aquatic life, support the results of the benthic community surveys, and contribute to the wildlife exposure assessment in conjunction with Phase 1 surface water data	Yes	SVOCs, pesticides, PCB congeners, total metals, dissolved metals, hardness, total mercury, dissolved mercury, alkalinity, methyl mercury, dioxin/furans, PAHs and alkyl PAHs, TOC, DOC, POC, TSS, TDS, SSC, dissolved cyanide, ammonia as nitrogen, total TKN, dissolved TKN, total nitrate/nitrite, dissolved nitrate/nitrite, total phosphorus, dissolved phosphorus, BOD5, BOD30, anions (bromide, chloride, and sulfate), temperature, salinity, turbidity, pH, DO, and conductivity	Appendix B: Phase 2 DSR
Phase 2	Study Area and Phase 2 reference areas		Surface Sediment Quality Triad and Additional Benthic Community Surface Water Analytical Chemistry and Water Quality Profiling	May to June 2014, August 2014	56 Study Area, 24 Phase 2 reference area	84 Study Area, 40 Phase 2 reference area	Surface water samples were collected from above the mudline and water quality profiles were conducted synoptically with the collection of sediment surface grab samples to support data interpretation in the BERA	Yes	Analytical chemistry: ammonia as nitrogen, total nitrate/nitrite, nitrate/nitrite, total TKN, TKN, total phosphorus, phosphorus, TOC, DOC, POC, TDS, and TSS	Appendix B: Phase 2 DSR

Table 2-2c
Summary of RI Study Data by Media – Water

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area and Phase 2 reference areas	Surface Water Sampling and Water Quality Profiling	Fish and Crab Community Water Quality Profiling	June 2014 (higher DO); August to September 2014 (lower DO)	6 Study Area zone, 4 Phase 2 reference area	--	Water quality profiling was conducted coincident with fish and crab community survey activities to support exposure assessment in the BERA and BHHRA and to provide supporting information for an evaluation of community structure for the BERA	Yes	Temperature, salinity, DO, turbidity, pH, and conductivity	Appendix B: Phase 2 DSR
	Study Area and Phase 2 reference areas		Caged Bivalve Water Quality Profiling	September to November 2014	10	--	Water quality profiling was conducted coincident with caged bivalve sampling to support data interpretation in the BERA	Yes	Temperature, salinity, DO, turbidity, pH, and conductivity	Appendix B: Phase 2 DSR
	East River		East River Surface Water Analytical Chemistry and Water Quality Profiling	June 2014 to March 2015	4	87	Surface water sampling and water column profiling was conducted to characterize suspended sediment and chemical loads entering Newtown Creek from the East River to support development of boundary conditions for the sediment transport and chemical fate and transport models along with refining the CSM	Yes	Conventional (total and dissolved), TOC, metals (total and dissolved), methyl mercury, SVOC, PAHs and alkylated PAHs, pesticides, dioxin/furans, PCB congeners, n-alkanes and isoprenoids and TPH, temperature, salinity, turbidity, pH, DO, and conductivity	Appendix B: Phase 2 DSR
	Study Area		Surface Water Sampling during Point Source Discharges	December 2014; March, April, August, and September 2015	18	196	Surface water sampling and water column profiling was conducted during five point source discharge events to further the understanding of fate and transport processes, refine the CSM, and support calibration of the chemical fate and transport model	Yes	Conventional (total and dissolved), TOC, metals (total and dissolved), methyl mercury, SVOC, PAHs, alkylated PAHs, pesticides, dioxin/furans, PCB congeners, n-alkanes and isoprenoids and TPH, temperature, salinity, turbidity, pH, DO, and conductivity	Appendix B: Phase 2 DSR
	Study Area		Continuous Water Quality Monitoring	July 2014 to May 2015, July to October 2015	21	--	Water quality profiling was conducted continuously to calibrate the hydrodynamic and propwash resuspension models as well as to develop a TSS and turbidity relationship using collocated surface water TSS data and sonde water column turbidity data	Yes	Temperature, salinity, turbidity, pH, DO, and conductivity	Appendix B: Phase 2 DSR
	Study Area		Surface Water TSS	August and October 2014	13	52	Surface water samples were collected coincident with continuous water quality sondes to develop a TSS and turbidity relationship using collocated surface water TSS data and sonde water column turbidity data	Yes	TSS, temperature, salinity, turbidity, pH, DO, and conductivity	Appendix B: Phase 2 DSR
Phase 1	Study Area	Current Meters	Current Meter and Surface Water TSS	2012 to 2013	5	--	Current meters were installed to collect flow data to support the evaluation of sediment and chemical transport and to support the hydrodynamic and sediment transport modeling effort	Yes	Current velocities	Phase 1 DSR 2
Phase 2	Study Area		Current Meter	2015	12	--	Current meters were installed to record current velocities associated with propwash, and during point source discharge events (including intervening dry weather periods) to refine the sediment transport models	Yes	Current velocities	Appendix B: Phase 2 DSR
Phase 1	Study Area	Surface Water Elevations	Tide Gauge	Installed in 2011	2	NA	Tide gauges were installed to record continuous water surface elevations at regular intervals in the Study Area during the course of the RI/FS to provide field sampling vertical control and develop a CSM for hydrodynamics in Newtown Creek	Yes	Surface water levels	Phase 1 DSR 2

Table 2-2c
Summary of RI Study Data by Media – Water

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area and Phase 2 reference areas	Porewater	Sediment Quality Triad Parameter Sampling	May to June 2014	36 Study Area; 24 Phase 2 reference area	36 Study Area; 24 Phase 2 reference area	Surface water sampling and water quality profiling were conducted coincident with the collection of surface sediment samples to support the sediment quality triad evaluation	Yes	Porewater field parameters: temperature, pH, conductivity, and ORP Pre- toxicity test: metals, mercury, ammonia as nitrogen, sulfide, and AVS/SEM Post-toxicity test: PCBs, high-resolution pesticides, metals, mercury, and AVS/SEM	Appendix B: Phase 2 DSR
Phase 2	Study Area		Groundwater Program – Surface and Mid-Depth Porewater	October 2014	17	51	Porewater was collected in surface and mid-depth sediment to provide supporting information for the chemical fate and transport modeling effort (i.e., to understand sediment-porewater partitioning characteristics and to understand groundwater/surface water interactions)	Yes	Surface porewater: VOCs, SVOCs, PAHs and alkylated PAHs, PCB congeners, TPH, dissolved metals, pesticides, dissolved mercury and methyl-mercury and dissolved TOC Mid-depth porewater: VOCs, SVOCs, PAHs and alkylated PAHs, TPH, metals, mercury, total cyanide, ammonia as nitrogen, nitrate/nitrite/total phosphorous, sulfate and sulfide, TOC, DOC, TSS, TDS, PCB congeners, pesticides, methyl mercury, bromide, chloride, fluoride, alkalinity, and hardness	Appendix B: Phase 2 DSR
Phase 2	Study Area	Groundwater	Groundwater	July to December 2014	65	65	Groundwater samples were collected from the native material to identify chemical concentrations associated with groundwater to support the modeling effort	Yes	VOCs, SVOCs, PAHs and alkylated PAHs, extractable and volatile petroleum hydrocarbons, pesticides, PCB congeners, total metals, dissolved metals, methyl mercury, total cyanide, ammonia as nitrogen, nitrate/nitrite/total phosphorous, sulfate and sulfide, TOC, DOC, TSS, TDS, bromide, chloride, fluoride, alkalinity, hardness, and salinity	Appendix B: Phase 2 DSR
Phase 2	Study Area and adjacent uplands		Groundwater Program – Slug Tests	August to December 2014, February and April 2015	13 Study Area (in-creek); 12 upland wells	No samples; slug test data from 25 wells	Slug tests were conducted to characterize the horizontal hydraulic conductivity of riverine sediment and underlying native material	Yes	Falling and rising head tests	Appendix B: Phase 2 DSR
Phase 2	Study Area		Groundwater Program – HPT	August to November 2014 and April 2014	24	No samples; HPT logs at 24 stations	HPT borings were completed to characterize the relative hydraulic conductivity of riverine sediment and underlying native material	Yes	Relative hydraulic conductivity	Appendix B: Phase 2 DSR
Phase 2	Study Area		Groundwater Program – Seepage	May to June 2015	17	17	Seepage meters were deployed to provide estimates of groundwater flux through the sediment layer	Yes	Seepage rates	Appendix B: Phase 2 DSR
Phase 2	Study Area and adjacent uplands	Groundwater	Groundwater Program – Long-term Monitoring	April to August 2015	13 Study Area (in-creek); 14 upland wells	No samples; potentiometric data from 13 in-creek and 14 upland wells	Long-term groundwater monitoring wells were installed to estimate the extent and magnitude of tidal effects and groundwater discharge	Yes	Long-term monitoring wells: Study Area long-term data loggers (pressure and conductivity)	Appendix B: Phase 2 DSR

Table 2-2c
Summary of RI Study Data by Media – Water

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 1	Study Area	Point Sources	Opportunistic Sampling	October to November 2011	7	7	Opportunistic samples were collected to identify potential upland sources for Phase 2 sampling	Yes	Conventionals, coliforms, metals, VOC, PCB Aroclors, pesticides and herbicides, TPH, DO, temperature, salinity, conductivity, pH, and turbidity	IDR
Phase 2	Study Area and Newtown Creek WWTP	Point Sources and Overland Flow	Point Sources and Overland Flows	June 2014 to December 2015	32	96	Point source discharges and overland flows were sampled to evaluate the composition and volume of potentially significant sources to support the CSM, risk assessments, modeling efforts, and evaluation of remedial alternatives in the FS	Yes	Point source water-general: alkalinity, anions, TDS, TSS, PAHs and alkyl PAHs, SVOCs, n-alkanes and isoprenoids, organochloride pesticides, total and dissolved metals, hardness, total and dissolved cyanide, total and dissolved phosphorous, ammonia as nitrogen, dissolved nitrate/nitrite, total TKN, POC, VOCs, herbicides, BOD, PCB congeners, dioxin/furans, total and dissolved mercury, methyl mercury, SSC, grain size, TOC, and DOC Point source water-dissolved/particulate: dissolved/particulate fractions of PAHs and alkylated PAHs, dioxin/furans, organochlorine pesticides, and PCB congeners Point source water-bulk sampling: grain size, total and dissolved metals, POC, TSS, PAHs and alkyl PAHs (particulate fraction), dioxin/furans (particulate fraction), organochloride pesticides (particulate fraction), and PCB congeners (particulate fraction); temperature, pH, salinity, DO, conductivity, and turbidity	Appendix B: Phase 2 DSR

Notes:
1 = Numbers are approximate and may vary depending on how quality assurance samples were counted.
-- = no data

Acronyms:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BERA = Baseline Ecological Risk Assessment
BHHRA = Baseline Human Health Risk Assessment
BOD = biochemical oxygen demand
CSM = conceptual site model
DO = dissolved oxygen
DOC = dissolved organic carbon

DSR = Data Summary Report
FS = Feasibility Study
HPT = hydraulic profiling tool
IDR = Interim Data Report
NA = not available
ORP = oxidation reduction potential
PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl
POC = particulate organic carbon
RI = Remedial Investigation
RI/FS = Remedial Investigation/Feasibility Study
SSC = suspended sediment concentration
SVOC = semivolatile organic compound
TDS = total dissolved solids

TKN = total Kjeldahl nitrogen
TOC = total organic carbon
TPH = total petroleum hydrocarbon
TSS = total suspended solids
VOC = volatile organic compound
WWTP = Wastewater Treatment Plant

References:
Anchor QEA, 2012. *Phase 1 Remedial Investigation Interim Data Report*. Newtown Creek Remedial Investigation/Feasibility Study. June 2012.
Anchor QEA, 2013a. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1*. Remedial Investigation/Feasibility Study, Newtown Creek. January 2013.
Anchor QEA, 2013b. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 2*. Remedial Investigation/Feasibility Study, Newtown Creek. April 2013.
Anchor QEA, 2013c. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 3*. Remedial Investigation/Feasibility Study, Newtown Creek. July 2013.
Anchor QEA, 2016. *Phase 2 Remedial Investigation Field Program Data Summary Report*. Remedial Investigation/ Feasibility Study, Newtown Creek. In preparation.

Table 2-2d
Summary of RI Study Data by Media – Ecology

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 2	Study Area	Caged Bivalve	Caged Bivalve	September through November 2014	10	10	Caged bivalves were deployed in the Study Area, monitored throughout the study, retrieved after 60 days, and tested for CERCLA hazardous substances to evaluate potential risks to bivalves as ecological receptors and to wildlife consuming bivalves from the Study Area	Yes	Pesticides, PCB congeners, metals, total and inorganic arsenic, methyl mercury, mercury, dioxin/furans, PAHs, percent lipids, percent moisture	Appendix B: Phase 2 DSR
Phase 1	Study Area	Benthic Community and Bioaccumulation	Surface Sediment Analytical Chemistry – Event 1	April to May 2012	34	34	Benthic community surveys collocated with surface and subsurface sediment sampling to characterize the physical properties and chemical nature of surface sediments, provide information for the risk assessments, characterize the potential for future natural recovery, and support the evaluation of potential remedial alternatives	Yes	Benthic community survey	Phase 1 DSR 1
	Study Area		Surface Sediment Analytical Chemistry – Event 2	August 2012	34	34	Benthic community surveys collocated with surface sediment sampling to characterize chemical and physical properties during lower DO level conditions	Yes	Benthic community survey	Phase 1 DSR 2
Phase 2	Study Area and Phase 2 reference areas		Surface Sediment Quality Triad	May to June 2014	36 Study Area; 24 Phase 2 reference area	60	Benthic community surveys were conducted coincident with porewater sampling, toxicity testing, surface sediment sampling, and surface water quality sampling to evaluate the concentration-response relationship for benthic invertebrates and bioavailability	Yes	Benthic community survey and toxicity testing	Appendix B: Phase 2 DSR
	Study Area		Additional Benthic Community	May, June, and August 2014	28 Study Area; 8 Phase 2 reference area	36	Benthic community surveys were conducted coincident with surface sediment sampling to support the wildlife assessment and to further evaluate the benthic community in English Kills	Yes	Benthic community survey	Appendix B: Phase 2 DSR
	Study Area		Bioaccumulation	May to June 2014	13	13	Bioaccumulation sampling was conducted coincident with porewater sampling, benthic community surveys, toxicity testing, surface sediment sampling, and surface water quality sampling to evaluate the concentration-response relationship for benthic invertebrates, bioavailability, and bioaccumulation	Yes	Lipid, moisture, metals, methyl mercury, PAHs, pesticides, dioxin/furans, and PCB congeners	Appendix B: Phase 2 DSR
Phase 1	Study Area	Fish and Crab	Fish and Crab Community Survey	April and August 2012	5 zones	NA	Fish and crab community surveys were conducted coincident with water quality profiling to collect data in support of the BERA and refine the CSM	Yes	Fish and crab community survey	Phase 1 DSR 1
Phase 2	Study Area and Phase 2 reference areas		Fish and Crab Community Survey and Tissue Sampling	June, August, and September 2014	6 Study Area zones; 4 Phase 2 reference area	252	Fish and crab community surveys and tissue sampling were conducted coincident with water quality profiling to support exposure assessment in the BERA and BHHRA and to provide information on community structure for the BERA	Yes	Pesticides, PCB congeners, metals, total and inorganic arsenic, methyl mercury, mercury, dioxin/furans, PAHs, percent lipids, percent moisture Fish and crab community survey	Appendix B: Phase 2 DSR

Table 2-2d
Summary of RI Study Data by Media – Ecology

Program	Location	Study	Field Program	Collection Date	Number of Stations	Number of Samples	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 1	Study Area	Habitat	Habitat Survey	June 2012	NA	NA	The survey documented specific ecological elements, including the presence, absence, and condition of shoreline vegetation, SAV, and wildlife	Yes	Habitat survey	Phase 1 DSR 1
	Phase 1 reference areas		Shoreline and Habitat Reconnaissance Survey	October 2012	NA	NA	The survey was conducted during Phase 1 reference area surface sediment sampling and documented shoreline observations, and other visual observations, including recreational and industrial use	Yes	Reconnaissance survey	Phase 1 DSR 2
Phase 2	Study Area and Phase 2 reference areas		Habitat Survey	May and June 2014	NA	NA	The survey documented the shoreline features and vegetation of the Study Area and Phase 2 reference areas to compare the habitat of the Study Area with the habitat of the Phase 2 reference areas	Yes	Habitat survey	Appendix B: Phase 2 DSR
Phase 2	Study Area and Phase 2 reference areas	Wildlife	Wildlife Survey	May, June, August, and September 2014	NA	NA	The survey documented species presence/absence information, general frequency of occurrence, site use, foraging activity, and prey type to better understand site use by wildlife receptors included in the BERA	Yes	Wildlife survey	Appendix B: Phase 2 DSR

Acronyms:

BERA = Baseline Ecological Risk Assessment
BHHRA = Baseline Human Health Risk Assessment
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CSM = conceptual site model
DO = dissolved oxygen
DSR = Data Summary Report

NA = not available
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RI = Remedial Investigation
SAV = submerged aquatic vegetation

References:

Anchor QEA, 2013a. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1.* Remedial Investigation/Feasibility Study, Newtown Creek. January 2013.
Anchor QEA, 2013b. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 2.* Remedial Investigation/Feasibility Study, Newtown Creek. April 2013.
Anchor QEA, 2016. *Phase 2 Remedial Investigation Field Program Data Summary Report.* Remedial Investigation/ Feasibility Study, Newtown Creek. In preparation.

Table 2-2e
Summary of RI Study Data by Media – Air

Program	Location	Study	Collection Date	Number of Stations	Number of Samples ¹	Description and Rationale/DQO	DQO Met	Analyses	Reference
Phase 1	Study Area and Background Locations	Air	July 2012	9 paired upland downwind/upwind; 6 on-creek; 5 background location	31	Ambient air sampling was conducted during a 24-hour sampling event using summa canisters to evaluate baseline concentrations of specific airborne chemicals, to measure the level of ambient concentrations within the breathing zone, and to estimate the portion of the measured concentrations that is potentially attributable to the Study Area for use in the BHHRA	Yes	VOCs and PCBs	Phase 1 DSR 1

Note:

1 = Numbers are approximate and may vary depending on how quality assurance samples were counted.

Acronyms:

DSR = Data Summary Report

PCB = polychlorinated biphenyl

RI = Remedial Investigation

VOC = volatile organic compound

Reference:

Anchor QEA, 2013a. *Phase 1 Remedial Investigation Field Program Data Summary Report – Submittal No. 1.* Remedial Investigation/Feasibility Study, Newtown Creek. January 2013.

Table 2-2f
Summary of RI Study Data by Media – Gas Ebullition

Program	Location	Study	Collection Date	Description and Rationale/DQO	DQO Met	Reference
Phase 1	5 Study Area zones	Field Ebullition Survey ¹	August 2015	Boat-based survey during various tide conditions to document evidence of apparent gas ebullition in sediment based on visual observation of surface water to support evaluation of potential remedial alternatives in the FS	Yes	Appendix B: Phase 2 DSR

Note:

1 = Program name in the DSR is Field Ebullition Survey, but when the main RI references the general survey, it is referred to as the gas ebullition field survey.

Acronyms:

DSR = Data Summary Report

FS = Feasibility Study

RI = Remedial Investigation

Table 2-3
Overall RI Analytical Completeness

Program	Count Results	Count Rejected Results	Percent Completeness	Completeness Goal
Phase 1	388,617	1,211	99.7%	90%
Phase 2	677,694	1,274	99.8%	90%
Total RI	1,066,311	2,485	99.8%	90%

Note:

Primary reasons for rejected data include the following: matrix interference, low matrix spike, low laboratory control sample, and/or low surrogates. See Phase 1 and 2 DSRs in Appendix B of the RI Report for complete lists and additional details.

Standard RI Report significant figures are not applied to counts or percentages.

Acronyms:

DSR = Data Summary Report

RI = Remedial Investigation

Table 3-1
Industrial Discharges Documented in 1959 NYSDOH Survey¹

Location	Industry	Product	Type Waste	Treatment	Water Index Number	Comments and Observations
Brooklyn	Transit Authority	Bus transportation garage	Bus washing, surface drainage	None	Newtown Creek; L.I. 4 (0.2)	Five outfalls: 3 to 4 inches, no flow 1 to 20 inches, no flow 1 to 6 inches, soapy; white turbid; discharge area affected, 4 x 10 feet
Brooklyn	Antipyros Co.	Dyers	Dye wastes, process rinse water, fabric wash water	None	Newtown Creek; L.I. 4 (0.5)	Two outfalls from one building housing all three firms. 1 – NW corner of building, submerged outlet; discharge affected, 25 x 50 feet; dark blue color 1- to 4-inch effluent; color varies, red, blue, and clear
Brooklyn	York Textile Co.	Silk screen printing	Rinse water, screen washing	None	Newtown Creek L.I. 4 (0.5)	
Brooklyn	P&N Finishing Co., Inc.	Commission dyers	Dye wastes, process rinse water, equipment washup, fabric wash water	None	Newtown Creek; L.I. 4 (0.5)	
Brooklyn	Lithograph Plate Graining & Supply Co.	Plate grainers for lithographers	Process wastes	Settling	City sewer, not intercepted; L.I. 4 (0.5)	--
Brooklyn	Marbek, Inc.	Plastic sheeting	Cooling water	None	Newtown Creek; L.I. 4 (0.5)	--
Brooklyn	Acme Steel Partition Co.	Metal partitioning	Cooling water for spot welders, floor drains	None	Newtown Creek; L.I. 4 (0.6)	--
Brooklyn	Walter Balfour & Co., Inc.	Rolling steel doors	Cooling water	None	City sewer, not intercepted; L.I. 4 (0.6)	--
Brooklyn	Eastern Farm Products, Inc.	Bottled milk and cream	Milk plant wastes, equipment wash-up, bottle washing, spillage, plant clean-up	None	City sewer, not intercepted; L.I. 4 (0.6)	--
Brooklyn	Shell Oil Co.	Bulk handling of petroleum products	Surface drainage	Oil separators	Newtown Creek; L.I. 4 (0.7)	Effluent not visible from shore
Brooklyn	A.J. Fretsey Corp.	Steel fabrication	Cooling water	None	City sewer, not intercepted; L.I. 4 (0.8)	--
Brooklyn	Wilmont & Cassidy, Inc.	Chemicals	Process water, equipment washup	None	City sewer, not intercepted; L.I. 4 (0.8)	--
Brooklyn	Williamsburg Steel Prod. Co.	Steel door frames, doors	Cooling water for spot welders	None	City sewer, not intercepted; L.I. 4 (0.9)	--
Brooklyn	Esso Standard Oil Co.	Bulk handling of petroleum products	Surface drainage	None	Newtown Creek; L.I. 4-5 (0.1)	--
Brooklyn	Levinon Mfg. Co., Inc.	Electrical wiring devices	Principally cooling water, some plating wastes, plant cleanup	None	City sewer, not intercepted; L.I. 4 (1.0)	--
Brooklyn	Metropolitan Curtain Cleaners, Inc.	Dry cleaning	Boiler blowdown	None	City sewer, not intercepted; L.I. 4 (1.0)	--
Brooklyn	Metropolitan Petroleum Corp.	Bulk handling of petroleum products	Surface drainage, water from heating coils	None	Newtown Creek; L.I. 4-5 (1.3)	Two outfalls: 8 inches, no flow 2 inches, clear, steaming water
Brooklyn	Manhattan Adhesive Corp.	Industrial adhesives	Equipment washup, floor drainage	None	Newtown Creek; L.I. 4-5 (1.4)	Outfall under building
Brooklyn	Mobil Oil Co. (Refinery)	Petroleum fuels, solvents, lubricants	Sanitary, process water, spills, equipment washup, plant cleanup, boiler blowdown, surface drainage	Septic tank, oil separator	Newtown Creek; L.I. 4-5 (1.4-1.8)	Effluent black
Brooklyn	Paragon Oil Co.	Bulk handling of fuel oil	Water from heating coils, truck washing, surface drainage	Oil separators	Newtown Creek; L.I. 4-5 (1.8)	8-inch outfall, effluent clear and steaming
Brooklyn	Long Island Soap Co.	Tallow, grease, meat meal	Process wastes mostly water from odor control equipment	Separator	City sewer, not intercepted; L.I. 4 (1.9)	--
Brooklyn	Anchor Metal Co., Inc.	Solder	Cooling water	None	City sewer, not intercepted; L.I. 4 (2.0)	--

Table 3-1
Industrial Discharges Documented in 1959 NYSDOH Survey¹

Location	Industry	Product	Type Waste	Treatment	Water Index Number	Comments and Observations
Brooklyn	Pinkas-Fischer Co., Inc.	Rendering	Process wastes	Grease trap (six compartments)	Newtown Creek; L.I. 4 (2.1)	12-inch outfall submerged
Brooklyn	Jos. Rosenberg's Sons, Inc.	Tallow	Equipment washup, floor drainage	Grease trap	Newtown Creek; L.I. 4 (2.1)	12-inch outfall
Brooklyn	Flag Packing Co.	Dog and cat food	Process wastes, equipment washup	None	Newtown Creek; L.I. 4 (2.1)	Effluent (white) trails 100 feet downstream; floating matter trails 30 feet downstream. Bank of stream used as dump site for fish carcass wastes.
Brooklyn	N.I. Malstrom and Co.	Lanolin derivatives	Water from washing wool grease	Neutralization, grease trap	City sewer, not intercepted; L.I. 4 (2.4)	--
Brooklyn	Brooklyn Union Gas Co.	Oil gas, tar, light oil	Process water from condensers and oil strippers	Separators and coke filters	Newtown Creek; L.I. 4 (2.4-2.8)	Standby plant, operates intermittently (19 hours in 1958)
Brooklyn	Gulf Oil Corp.	Bulk handling of fuel oil	Surface drainage	Separator	City sewer, not intercepted; L.I. 4 (2.8)	Oil slick on effluent from city sewer
Brooklyn	Morania Oil Co., Inc.	Bulk handling of petroleum products	Surface drainage	None	City sewer, not intercepted; L.I. 4 (2.8)	--
Brooklyn	Preferred Oil Co.	Bulk handling of petroleum products	Surface drainage	Separators	Newtown Creek; L.I. 4 (2.8)	12-inch outfall, no sign of oil
Brooklyn	N.Y. Hill Lithograph Corp.	Printing	Gum arabic in equipment washup waters	None	City sewer, not intercepted; L.I. 4 (3.3)	--
Brooklyn	American Oil Co.	Petroleum product storage	Surface drainage	None	Newtown Creek; L.I. 4 (3.4)	--
Brooklyn	Good Humor Co.	Ice cream products	Equipment washup, plant cleanup	None	Newtown Creek; L.I. 4 (3.4)	--
Brooklyn	Colonial Sand & Stone Co.	Sand, gravel, stone, concrete	Truck washing	Settling tank	Newtown Creek; L.I. 4 (3.5)	--
Brooklyn	Premium Coal & Oil Co.	Bulk handling of fuel oil	Surface drainage	Separators	Newtown Creek; L.I. 4 (3.8)	Two 3-inch outfalls, no flow
Queens	The National Sugar Refinery Co.	Refined sugar	Process wastes, cooling water, boiler blowdown, sanitary wastes	None	East River; E.R. (5.0) and Newtown Creek; L.I. 4 (0.1)	Two outlets: 20-inch submerged; effluent brown, turbid, steaming; discharge area affected, 50 x 100 feet 36-inch submerged; mostly cooling water One outlet: 6-inch submerged
Queens	Sun Oil Co.	Bulk handling of fuel oil	Surface drainage	None	Newtown Creek; L.I. 4 (0.5)	No sewer to creek
Queens	N.Y.C. Poultry Market	Wholesale handling of live poultry	Wastes from cleanup of building	None	Newtown Creek; L.I. 4 (0.7)	--
Queens	Horowitz Bros. & Margareten	Matzoh baking, noodle manufacture	Equipment washup	None	Dutch Kills; L.I. 4-3 (0.1)	8-inch outfall, not located
Queens	Texaco, Inc.	Bulk handling of fuel oil	Garage and surface drainage	Separator	Dutch Kills; L.I. 4-3 (0.1)	12-inch outfall submerged
Queens	Seaporcel Metals, Inc.	Porcelain enamel on steel	Equipment washup, wasted porcelain, frits, clays, color pigments	None	Dutch Kills; L.I. 4-3 (0.2)	Outfall submerged; effluent gray, turbid; discharge effect 25 x 60 feet.; gasification from sludge deposits
Queens	Irving Subway Grating Co., Inc.	Open steel flooring stair treads	Cooling water, surface drainage (including lot where trichlorethylene truck is washed)	None	Dutch Kills; L.I. 4-3 (0.3)	8-inch outfall submerged
Queens	Principe-Danna, Inc.	Ready-mix and pre-cast concrete	Truck washing and surface drainage	None	Dutch Kills; L.I. 4-3 (0.5)	--
Queens	Sinclair Refining Co.	Bulk handling of fuel oil	Surface drainage	Separator ²	Newtown Creek; L.I. 4 (1.5)	No sewer
Queens	Van Iderstine Co.	Animal by-product	Drippings, equipment washup	Settling basins	Newtown Creek; L.I. 4 (1.5)	18-inch outfall submerged. Scum and floating solids on surface; some gasification from bottom deposits.

Table 3-1
Industrial Discharges Documented in 1959 NYSDOH Survey¹

Location	Industry	Product	Type Waste	Treatment	Water Index Number	Comments and Observations
Queens	Triplex Oil Refining Co.	Refines used lubricating oil	Surface drainage, sanitary wastes	None	Newtown Creek; L.I. 4 (1.6)	4-inch outfall, effluent black
Queens	Abrasive Blast Cleaning Corp.	Sand blasting service	Cooling water	None	Newtown Creek; L.I. 4 (1.7)	Outfall not located
Queens	Liebros Casting Co., Inc.	Investment casting	Water from making plastic molds	None	Newtown Creek; L.I. 4 (1.8)	Outfall not located
Queens	Phelps Dodge Corp.	Refined copper	Cooling water, boiler blowdown steam condensate, water from slag granulating sanitary wastes	Water from slag granulating goes through sedimentation pit	Newtown Creek; L.I. 4 (2.1-2.5)	Ten outlets: 4-inch boiler blowdown 2-inch boiler blowdown 30 +/- inch cooling water, storm drainage, sanitary 24-by-12-inch storm drain, boiler blowdown 36-by-12-inch storm drain, sanitary wastes 12-by-12-inch water from slag granulating 2- to 1-inch drains for oil storage heating systems 24-inch flume storm drain and steam condensates 18-by-18-inch storm drain; shore adjacent to oil storage showed evidence of oil spillage
Queens	Gordon Lacey	Plastic film coatings	Cooling water, floor drains	None	Maspeth Creek; L.I. 4-7 (0.1)	Outfall not visible, flow from bank contained floating while curds
Queens	Lindenherst Textiles, Inc.	Screen printings	Washing from screens	None	Maspeth Creek; L.I. 4-7 (0.2)	Outfall under dock

Notes:

- 1 = Unless otherwise noted, information in this table is taken directly from Table 4 of the NYSDOH Water Pollution Control Board report entitled, *New York City Water Survey Series #4 Lower East River* .
- 2 = A 400-gallon oil separator leading to a cesspool is documented in the NYSDOH Water Pollution Control Board Water User Survey for this facility (Hazen and Sawyer 1959).

Acronyms:

- E.R. = East River
- L.I. = Long Island
- NYSDOH = New York State Department of Health

Reference:

Hazen and Sawyer, 1959. Water Pollution Control Board State of New York Form. Prepared for New York State Department of Health, Water Pollution Control Board. August 17, 1959.

Table 4-1
Programs Included in Surface Sediment RI Dataset

Data	Description
Phase 1	Phase 1 (spring and summer programs) ¹
Phase 2	Point sources
	Triad and bioaccumulation
	Additional benthic community
	Sediment mounds
	Additional nearshore
	Occupational exposure
	Additional human health nearshore
	Confirmation of contaminant distribution
	Groundwater program surface samples
	Post-NYC dredge program surface samples
National Grid	National Grid surface samples

Note:

1 = NC003, NC012, and WC003 are excluded from the RI dataset due to maintenance dredging.

Acronyms:

NYC = New York City

RI = Remedial Investigation

Table 4-2
Percent Fines in Surface Sediment – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	76	76	100	6.4	55	54	92	24
	East Branch	35	35	100	1.4	57	52	93	24
	Maspeth Creek	26	26	100	5.0	40	43	90	22
	Dutch Kills	35	35	100	6.4	72	62	98	30
	Whale Creek	9	9	100	16	71	63	97	27
Main Stem	CM 0 – 1	76	76	100	3.7	85	78	99	23
	CM 1 – 2	58	58	100	10	91	84	99	19
	CM 2+	63	63	100	3.8	79	71	100	25
Reference Areas									
Industrial/CSO	Westchester Creek	18	18	100	24	75	66	99	29
	Brooklyn Navy Yard	8	8	100	14	97	80	100	33
	Flushing Creek	6	6	100	47	88	81	97	19
	Coney Island Creek	8	8	100	1.2	31	33	66	25
Industrial/Non-CSO	Head of Bay	18	18	100	1.6	52	47	83	30
	Mill Basin	8	8	100	18	90	81	94	26
	Steinway Creek	7	7	100	75	98	93	100	11
	Lower East River	6	6	100	2.4	7.8	7.2	11	3.9
Non-Industrial/CSO	Spring Creek	18	18	100	4.2	34	41	93	27
	Fresh Creek Basin	7	7	100	7.0	71	65	94	32
	Throgs Neck	6	6	100	5.3	37	36	69	26
Non-Industrial/ Non-CSO	Gerritsen Creek	18	18	100	1.3	48	47	92	32
	Hendrix Creek	7	7	100	7.6	64	54	99	40
	Sheepshead Bay	8	8	100	2.2	91	74	98	34

Notes:

Units are weight percent.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Depth range for surface sediment is 0 – 15 centimeters.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

Table 4-3
TOC in Surface Sediment – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	79	79	100	1.4	11	11	19	3.4
	East Branch	37	37	100	1.0	13	13	20	3.6
	Maspeth Creek	26	26	100	2.5	11	10	17	4.1
	Dutch Kills	37	37	100	3.2	9.0	9.7	20	3.7
	Whale Creek	9	9	100	0.80	5.0	4.6	6.4	1.6
Main Stem	CM 0 – 1	79	79	100	0.23	3.8	3.9	10	1.1
	CM 1 – 2	61	61	100	3.6	5.3	5.5	9.6	1.2
	CM 2+	98	98	100	3.4	9.3	9.6	26	2.9
Reference Areas									
Industrial/CSO	Westchester Creek	18	18	100	1.4	4.4	5.0	9.4	2.1
	Brooklyn Navy Yard	8	8	100	3.0	3.2	4.4	7.6	2.0
	Flushing Creek	6	6	100	2.2	5.3	6.1	12	3.6
	Coney Island Creek	8	8	100	0.65	10	9.2	16	5.1
Industrial/Non-CSO	Head of Bay	18	18	100	0.065	5.3	4.3	7.8	2.6
	Mill Basin	8	8	100	1.6	5.5	5.6	8.9	2.3
	Steinway Creek	7	7	100	2.9	3.5	5.1	9.6	3.0
	Lower East River	6	6	100	0.79	1.9	1.8	2.8	0.69
Non-Industrial/CSO	Spring Creek	18	18	100	0.16	3.7	3.3	7.1	2.0
	Fresh Creek Basin	7	7	100	3.3	9.0	9.0	15	4.2
	Throgs Neck	6	6	100	0.42	2.4	2.5	4.7	1.5
Non-Industrial/ Non-CSO	Gerritsen Creek	18	17	94	0.05	3.2	3.1	6.6	2.2
	Hendrix Creek	7	7	100	2.1	6.1	5.7	11	3.0
	Sheepshead Bay	8	8	100	0.17	6.0	6.5	13	3.9

Notes:

Units are weight percent.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Depth range for surface sediment is 0 – 15 centimeters.

Totals reported using Kaplan-Meier, if applicable.

Phase 1 TOC consists of reanalyzed TOC and TOC * correction factor.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

TOC = total organic carbon

Table 4-4
Total PAH (17) in Surface Sediment – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	71	71	100	5.9	70	80	290	48
	East Branch	33	33	100	6.3	49	65	370	62
	Maspeth Creek	23	23	100	5.6	53	62	180	38
	Dutch Kills	33	33	100	12	55	55	130	28
	Whale Creek	9	9	100	7.8	30	27	40	10
Main Stem	CM 0 – 1	64	64	100	2.2	15	26	570	70
	CM 1 – 2	47	47	100	13	25	27	94	14
	CM 2+	86	86	100	25	74	130	1,200	180
Reference Areas (95/95 UTL = 52)									
Industrial/CSO	Westchester Creek	18	18	100	3.6	15	22	54	17
	Brooklyn Navy Yard	8	8	100	6.1	10	13	29	7.6
	Flushing Creek	6	6	100	14	26	25	37	8.7
	Coney Island Creek	8	8	100	1.3	41	66	300	98
Industrial/Non-CSO	Head of Bay	18	18	100	0.15	4.9	5.2	13	3.7
	Mill Basin	8	8	100	2.0	7.7	16	55	19
	Steinway Creek	7	7	100	8.3	11	20	48	17
	Lower East River	6	6	100	3.3	19	18	29	8.9
Non-Industrial/CSO	Spring Creek	18	18	100	0.13	3.3	4.1	16	4.1
	Fresh Creek Basin	7	7	100	1.5	14	18	49	17
	Throgs Neck	6	6	100	6.3	13	15	29	9.0
Non-Industrial/ Non-CSO	Gerritsen Creek	18	18	100	0.030	2.1	2.1	5.1	1.6
	Hendrix Creek	7	7	100	1.8	3.4	4.6	13	3.9
	Sheepshead Bay	8	8	100	0.15	9.9	13	43	14

Table 4-4
Total PAH (17) in Surface Sediment – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Depth range for surface sediment is 0 – 15 centimeters.

Totals reported using Kaplan-Meier, if applicable.

95/95 UTL is the 95/95 upper tolerance limit of the surface sediment data from reference areas.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

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Table 4-5
Total PCBs in Surface Sediment – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	71	71	100	0.40	8.4	12	63	12
	East Branch	33	33	100	0.024	1.3	2.2	12	2.8
	Maspeth Creek	23	23	100	0.29	1.4	3.1	25	5.6
	Dutch Kills	33	33	100	0.20	2.3	15	380	65
	Whale Creek	9	9	100	0.36	1.4	1.4	3.4	0.85
Main Stem	CM 0 – 1	64	64	100	0.12	0.62	0.67	3.0	0.44
	CM 1 – 2	47	47	100	0.49	1.0	1.1	3.0	0.40
	CM 2+	86	86	100	1.0	7.6	11	90	12
Reference Areas (95/95 UTL = 1.0)									
Industrial/CSO	Westchester Creek	18	18	100	0.085	0.30	0.29	0.45	0.095
	Brooklyn Navy Yard	8	8	100	0.25	0.43	0.48	0.84	0.19
	Flushing Creek	6	6	100	0.15	0.69	0.63	0.88	0.26
	Coney Island Creek	8	8	100	0.073	0.45	0.49	0.88	0.26
Industrial/Non-CSO	Head of Bay	18	15	83	0.0029	0.11	0.11	0.22	0.064
	Mill Basin	8	8	100	0.095	0.17	0.33	0.81	0.29
	Steinway Creek	7	7	100	0.23	0.29	0.65	1.8	0.61
	Lower East River	6	6	100	0.049	0.11	0.14	0.38	0.12
Non-Industrial/CSO	Spring Creek	18	17	94	0.0052	0.081	0.12	0.30	0.11
	Fresh Creek Basin	7	7	100	0.12	1.1	2.4	6.3	2.5
	Throgs Neck	6	6	100	0.023	0.11	0.12	0.24	0.091
Non-Industrial/Non-CSO	Gerritsen Creek	18	18	100	0.0054	0.14	0.14	0.29	0.089
	Hendrix Creek	7	7	100	0.088	0.17	0.47	1.6	0.58
	Sheepshead Bay	8	8	100	0.0026	0.28	0.45	1.6	0.51

Table 4-5
Total PCBs in Surface Sediment – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Depth range for surface sediment is 0 – 15 centimeters.

Totals reported using Kaplan-Meier, if applicable.

95/95 UTL is the 95/95 upper tolerance limit of the surface sediment data from reference areas.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PCB = polychlorinated biphenyl

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Table 4-6
Copper in Surface Sediment – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	71	71	100	150	790	920	4,300	690
	East Branch	33	33	100	32	310	570	6,300	1,100
	Maspeth Creek	23	23	100	72	400	730	5,900	1,200
	Dutch Kills	33	33	100	110	360	380	850	190
	Whale Creek	9	9	100	81	280	300	530	130
Main Stem	CM 0 – 1	64	64	100	11	120	140	780	94
	CM 1 – 2	47	47	100	69	270	290	650	120
	CM 2+	86	86	100	120	2,500	3,600	37,000	5,200
Reference Areas (95/95 UTL = 350)									
Industrial/CSO	Westchester Creek	18	18	100	23	140	140	250	58
	Brooklyn Navy Yard	8	8	100	90	110	120	170	28
	Flushing Creek	6	6	100	100	200	190	250	51
	Coney Island Creek	8	8	100	110	310	290	450	130
Industrial/Non-CSO	Head of Bay	18	18	100	2.2	92	80	150	50
	Mill Basin	8	8	100	76	95	150	310	93
	Steinway Creek	7	7	100	110	130	170	310	82
	Lower East River	6	6	100	19	49	41	53	16
Non-Industrial/CSO	Spring Creek	18	18	100	5.6	52	59	150	46
	Fresh Creek Basin	7	7	100	20	180	210	460	150
	Throgs Neck	6	6	100	17	57	60	120	39
Non-Industrial/Non-CSO	Gerritsen Creek	18	18	100	4.6	68	66	140	44
	Hendrix Creek	7	7	100	43	140	170	450	140
	Sheepshead Bay	8	8	100	5.1	130	140	300	91

Table 4-6
Copper in Surface Sediment – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Depth range for surface sediment is 0 – 15 centimeters.

Totals reported using Kaplan-Meier, if applicable.

95/95 UTL is the 95/95 upper tolerance limit of the surface sediment data from reference areas.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

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Table 4-7a
NYC Post-Dredge Sampling – Results from Main Stem

Chemical	Range of Surface Sediment Concentrations in First Mile	Concentration Range from NYC Dredge Area Cores			
		Locations with No Sand Cover	Locations with Variable Sand Cover	Sample of Location with Only Sand Cover Material	Samples Beneath Sand Cover Material
Total PAH (17)	2.2 – 570	13 - 19	2.7 – 19	2.2	2.8 – 15
Total PCBs	0.12 – 3.0	0.64 – 1.1	0.36 – 0.74	0.18	0.64 – 2.1
Copper	11 – 780	130 – 280	40 – 180	11	26 – 320

Notes:

Units are milligrams per kilogram.

Values are rounded to two significant figures.

Sample of Location with Only Sand Cover Material is from NC003SC-F.

Acronyms:

NYC = New York City

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

Table 4-7b
NYC Post-Dredge Sampling – Results from Whale Creek

Chemical	Range of Surface Sediment Concentrations in Whale Creek	NYC Dredge Area Cores		
		Location with No Sand Cover	Location with Variable Sand Cover	Sample Beneath Sand Cover Material
Total PAH (17)	7.8 – 40	36	7.8	33
Total PCBs	0.36 – 3.4	3.4	0.36	1.9
Copper	81 – 530	530	81	770

Notes:

Units are milligrams per kilogram.

Values are rounded to two significant figures.

Whale Creek had one NYC Post-Dredge location with no sand cover and one with variable sand cover.

Acronyms:

NYC = New York City

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

Table 4-8
Individual PAH Compounds Included in Various PAH Sums

Chemical Name	PAH (34)	PAH (17)	LPAH	HPAH
2-Methylnaphthalene	✓	✓	✓	--
Acenaphthene	✓	✓	✓	--
Acenaphthylene	✓	✓	✓	--
Anthracene	✓	✓	✓	--
Fluorene	✓	✓	✓	--
Naphthalene	✓	✓	✓	--
Phenanthrene	✓	✓	✓	--
Benzo(a)anthracene	✓	✓	--	✓
Benzo(a)pyrene	✓	✓	--	✓
Benzo(b)fluoranthene	✓	✓	--	✓
Benzo(g,h,i)perylene	✓	✓	--	✓
Benzo(j,k)fluoranthene	✓	✓	--	✓
Chrysene	✓	✓	--	✓
Dibenzo(a,h)anthracene	✓	✓	--	✓
Fluoranthene	✓	✓	--	✓
Indeno(1,2,3-c,d)pyrene	✓	✓	--	✓
Pyrene	✓	✓	--	✓
Benzo(e)pyrene	✓	--	--	--
Perylene	✓	--	--	--
C1-Benzanthracenes/Chrysenes	✓	--	--	--
C1-Fluoranthenes/Pyrenes	✓	--	--	--
C1-Phenanthrenes/Anthracenes	✓	--	--	--
C2-Benzanthracenes/Chrysenes	✓	--	--	--
C2-Fluorenes	✓	--	--	--
C2-Naphthalenes	✓	--	--	--
C2-Phenanthrenes/Anthracenes	✓	--	--	--
C3-Benzanthracenes/Chrysenes	✓	--	--	--
C3-Fluorenes	✓	--	--	--
C3-Naphthalenes	✓	--	--	--
C3-Phenanthrenes/Anthracenes	✓	--	--	--
C4-Benzanthracenes/Chrysenes	✓	--	--	--
C4-Chrysenes	✓	--	--	--
C4-Naphthalenes	✓	--	--	--
C4-Phenanthrenes/Anthracenes	✓	--	--	--
Total Number of Compounds	34	17	7	10

Notes:

✓ = PAH or PAH class that is a member of the sum -- = PAH or PAH class not a member of the sum

Acronyms:

HPAH = high-molecular-weight polycyclic aromatic hydrocarbon

LPAH = low-molecular-weight polycyclic aromatic hydrocarbon

PAH = polycyclic aromatic hydrocarbon

Table 4-9
Percent Fines in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
English Kills								
15 – 60	27	27	100	3.9	53	47	88	25
60 – 100	26	26	100	8.2	43	48	92	25
100 – 200	24	24	100	15	59	54	99	22
200 – 300	21	21	100	15	48	49	88	22
300 – 400	11	11	100	4.0	65	55	85	27
400 – 500	3	3	100	34	55	52	66	16
500 – 600	0	0	--	--	--	--	--	--
East Branch								
15 – 60	12	12	100	5.3	62	53	92	33
60 – 100	11	11	100	9.2	53	52	87	26
100 – 200	12	12	100	6.5	47	42	72	28
200 – 300	12	12	100	5.7	44	39	73	23
300 – 400	8	8	100	17	44	45	76	21
400 – 500	6	6	100	28	41	43	76	18
500 – 600	1	1	100	54	--	--	54	--
Maspeth Creek								
15 – 60	5	5	100	6.0	55	47	62	23
60 – 100	5	5	100	5.3	61	58	96	35
100 – 200	4	4	100	9.4	66	58	91	35
200 – 300	4	4	100	32	70	65	87	26
300 – 400	4	4	100	23	74	64	84	28
400 – 500	3	3	100	59	70	73	90	16
500 – 600	1	1	100	84	--	--	84	--
Dutch Kills								
15 – 60	11	11	100	52	74	71	91	13
60 – 100	10	10	100	46	63	67	93	17
100 – 200	11	11	100	29	59	55	80	18
200 – 300	9	9	100	17	41	49	84	25
300 – 400	5	5	100	13	64	60	92	31
400 – 500	3	3	100	48	67	66	83	17
500 – 600	0	0	--	--	--	--	--	--
Whale Creek								
15 – 60	2	2	100	79	86	86	94	11
60 – 100	2	2	100	85	87	87	88	2.1
100 – 200	2	2	100	55	68	68	80	18
200 – 300	2	2	100	35	49	49	63	20
300 – 400	1	1	100	64	--	--	64	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--

Table 4-9
Percent Fines in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
CM 0 – 1								
15 – 60	21	21	100	5.6	90	74	99	30
60 – 100	19	19	100	5.4	79	69	97	31
100 – 200	17	17	100	2.7	60	57	96	33
200 – 300	11	11	100	7.3	48	48	86	22
300 – 400	4	4	100	18	65	59	87	31
400 – 500	2	2	100	40	61	61	81	29
500 – 600	0	0	--	--	--	--	--	--
CM 1 – 2								
15 – 60	22	22	100	26	79	77	95	16
60 – 100	21	21	100	12	65	58	95	25
100 – 200	21	21	100	7.4	55	50	89	23
200 – 300	9	9	100	37	56	55	73	12
300 – 400	2	2	100	3.1	21	21	38	25
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--
CM 2+								
15 – 60	24	24	100	3.8	76	67	98	30
60 – 100	24	24	100	15	78	68	98	28
100 – 200	20	20	100	19	74	72	98	23
200 – 300	15	15	100	13	52	60	94	26
300 – 400	9	9	100	31	57	60	99	25
400 – 500	5	5	100	54	74	74	98	18
500 – 600	3	3	100	35	69	67	96	31

Notes:

Units are milligrams per kilogram. Totals reported using Kaplan-Meier, if applicable.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes only subsurface sediment samples from cores that were sampled continuously.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

cm = centimeter

MDL = method detection limit

Table 4-10
TOC in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
English Kills								
15 – 60	30	30	100	0.72	13	12	22	4.8
60 – 100	29	29	100	2.9	16	14	28	5.7
100 – 200	28	28	100	7.5	12	14	25	4.8
200 – 300	26	26	100	4.7	15	15	23	5.2
300 – 400	10	10	100	0.26	21	17	25	9.0
400 – 500	2	2	100	17	19	19	22	3.4
500 – 600	0	0	--	--	--	--	--	--
East Branch								
15 – 60	16	16	100	0.31	11	9.2	19	6.2
60 – 100	15	15	100	0.85	14	14	42	10
100 – 200	15	15	100	3.9	14	13	43	10
200 – 300	20	20	100	1.1	8.1	11	41	9.5
300 – 400	14	14	100	0.70	11	10	20	5.7
400 – 500	6	6	100	8.0	15	15	22	5.8
500 – 600	1	1	100	11	--	--	11	--
Maspeth Creek								
15 – 60	5	5	100	4.7	17	15	24	6.9
60 – 100	5	5	100	3.9	18	15	19	6.3
100 – 200	4	4	100	8.1	17	16	21	5.6
200 – 300	4	4	100	12	18	17	22	4.5
300 – 400	4	4	100	15	18	18	20	2.1
400 – 500	3	3	100	9.1	13	14	20	5.5
500 – 600	1	1	100	13	--	--	13	--
Dutch Kills								
15 – 60	16	16	100	1.2	6.9	7.8	15	4.6
60 – 100	14	14	100	1.3	12	10	19	5.7
100 – 200	17	17	100	1.3	9.1	9.8	18	6.2
200 – 300	14	14	100	0.084	9.2	9.3	21	5.9
300 – 400	6	6	100	5.5	12	12	20	4.8
400 – 500	3	3	100	1.0	3.6	5.1	11	5.0
500 – 600	0	0	--	--	--	--	--	--
Whale Creek								
15 – 60	2	2	100	6.5	7.3	7.3	8.1	1.1
60 – 100	2	2	100	10	10	10	10	0.18
100 – 200	2	2	100	8.7	9.8	9.8	11	1.6
200 – 300	2	2	100	3.0	6.8	6.8	11	5.4
300 – 400	1	1	100	8.8	--	--	8.8	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--

Table 4-10
TOC in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
CM 0 – 1								
15 – 60	24	24	100	1.8	4.4	5.9	18	3.6
60 – 100	22	22	100	0.26	4.7	6.6	16	4.2
100 – 200	28	28	100	0.4	7.2	7.9	16	4.7
200 – 300	12	12	100	0.59	8.2	11	26	6.9
300 – 400	4	4	100	0.82	5.9	8.1	20	8.1
400 – 500	2	2	100	5.3	6.5	6.5	7.8	1.8
500 – 600	0	0	--	--	--	--	--	--
CM 1 – 2								
15 – 60	22	22	100	5.1	7.7	8.5	18	3.0
60 – 100	21	21	100	5.4	10	11	22	4.1
100 – 200	21	21	100	0.64	13	11	22	4.9
200 – 300	9	9	100	8.4	13	13	21	3.8
300 – 400	2	2	100	1.4	2.4	2.4	3.5	1.5
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--
CM 2+								
15 – 60	68	68	100	0.32	12	12	39	4.8
60 – 100	46	46	100	0.50	14	14	24	4.3
100 – 200	43	43	100	2.3	14	14	29	5.2
200 – 300	32	32	100	1.5	14	13	35	7.8
300 – 400	16	16	100	0.85	17	15	33	11
400 – 500	6	6	100	3.5	8.8	9.4	19	5.3
500 – 600	3	3	100	1.2	9.4	10	21	9.8

Notes:

Units are milligrams per kilogram. Totals reported using Kaplan-Meier, if applicable.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes only subsurface sediment samples from cores that were sampled continuously.

Phase 1 TOC consists of reanalyzed TOC and TOC * correction factor.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

cm = centimeter

MDL = method detection limit

TOC = total organic carbon

Table 4-11
Total PAH (17) in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
English Kills								
15 – 60	26	26	100	5.0	150	250	1,400	320
60 – 100	25	25	100	29	140	220	1,500	300
100 – 200	23	23	100	4.1	180	330	1,900	450
200 – 300	20	20	100	14	170	260	1,300	270
300 – 400	10	10	100	1.8	270	270	600	180
400 – 500	2	2	100	210	310	310	410	140
500 – 600	0	0	--	--	--	--	--	--
East Branch								
15 – 60	12	12	100	13	110	160	670	180
60 – 100	11	11	100	53	160	420	2,200	640
100 – 200	12	12	100	30	200	430	3,100	860
200 – 300	12	12	100	21	230	270	750	260
300 – 400	8	8	100	12	200	220	390	130
400 – 500	6	6	100	63	200	250	640	210
500 – 600	1	1	100	99	--	--	99	--
Maspeth Creek								
15 – 60	5	5	100	13	110	250	860	350
60 – 100	5	5	100	37	130	160	340	110
100 – 200	4	4	100	120	190	190	270	76
200 – 300	4	4	100	300	660	710	1,200	470
300 – 400	4	4	100	380	860	910	1,500	590
400 – 500	3	3	100	220	250	720	1,700	840
500 – 600	1	1	100	320	--	--	320	--
Dutch Kills								
15 – 60	11	11	100	19	110	100	170	53
60 – 100	10	10	100	18	190	310	1,200	340
100 – 200	11	11	100	30	140	300	890	300
200 – 300	9	9	100	35	190	390	1,800	560
300 – 400	5	5	100	30	260	580	2,100	840
400 – 500	3	3	100	8.8	53	350	980	550
500 – 600	0	0	--	--	--	--	--	--
Whale Creek								
15 – 60	2	2	100	91	92	92	93	1.4
60 – 100	2	2	100	130	360	360	600	340
100 – 200	2	2	100	390	830	830	1,300	610
200 – 300	2	2	100	160	340	340	520	260
300 – 400	1	1	100	510	--	--	510	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--

Table 4-11
Total PAH (17) in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
CM 0 – 1								
15 – 60	20	20	100	13	22	130	1,100	270
60 – 100	18	18	100	0.59	24	99	810	190
100 – 200	16	16	100	16	54	860	4,200	1,500
200 – 300	11	11	100	34	140	1,300	11,000	3,300
300 – 400	4	4	100	25	33	45	88	29
400 – 500	2	2	100	29	34	34	39	6.7
500 – 600	0	0	--	--	--	--	--	--
CM 1 – 2								
15 – 60	22	22	100	26	70	140	590	170
60 – 100	21	21	100	48	170	240	1,200	260
100 – 200	21	21	100	28	290	440	2,800	570
200 – 300	9	9	100	300	690	880	1,700	530
300 – 400	2	2	100	48	85	85	120	52
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--
CM 2+								
15 – 60	68	68	100	11	170	540	4,900	1,000
60 – 100	46	46	100	0.11	300	450	2,000	440
100 – 200	43	43	100	110	600	2,500	49,000	7,700
200 – 300	32	32	100	7.6	740	3,400	26,000	6,000
300 – 400	16	16	100	6.3	1,000	7,100	36,000	11,000
400 – 500	6	6	100	190	340	840	3,400	1,200
500 – 600	3	3	100	43	280	1,800	5,200	2,900

Notes:

Units are milligrams per kilogram. Totals reported using Kaplan-Meier, if applicable.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes only subsurface sediment samples from cores that were sampled continuously.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

cm = centimeter

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-12
Total PCBs in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
English Kills								
15 – 60	26	26	100	4.8	24	29	89	21
60 – 100	25	25	100	0.028	42	41	100	27
100 – 200	23	23	100	0.015	34	46	130	37
200 – 300	20	20	100	0.0032	44	55	170	49
300 – 400	10	10	100	0.13	26	45	130	46
400 – 500	2	2	100	53	70	70	86	24
500 – 600	0	0	--	--	--	--	--	--
East Branch								
15 – 60	12	12	100	0.22	6.5	9.3	34	9.9
60 – 100	11	11	100	0.45	8.8	10	39	11
100 – 200	12	12	100	0.11	11	13	46	14
200 – 300	12	12	100	0.056	5.4	11	45	14
300 – 400	8	8	100	0.49	6.6	7.7	18	6.4
400 – 500	6	6	100	4.4	12	13	35	11
500 – 600	1	1	100	7.5	--	--	7.5	--
Maspeth Creek								
15 – 60	5	5	100	3.8	8.1	9.7	17	6.3
60 – 100	5	4	80	0.0030	10	7.3	13	6.7
100 – 200	4	4	100	0.084	8.9	11	24	10
200 – 300	4	4	100	0.25	5.4	12	37	17
300 – 400	4	4	100	0.25	5.1	6.6	16	6.7
400 – 500	3	3	100	0.93	1.4	2.2	4.2	1.8
500 – 600	1	1	100	0.72	--	--	0.72	--
Dutch Kills								
15 – 60	11	11	100	1.3	7.2	9.3	21	7.4
60 – 100	10	10	100	1.7	11	14	35	11
100 – 200	11	11	100	2.0	3.5	11	35	12
200 – 300	9	9	100	0.30	5.3	8.7	34	11
300 – 400	5	4	80	0.0033	6.0	3.9	7.1	3.6
400 – 500	3	2	67	0.0032	0.023	0.35	1.0	0.58
500 – 600	0	0	--	--	--	--	--	--
Whale Creek								
15 – 60	2	2	100	1.8	4.8	4.8	7.7	4.2
60 – 100	2	2	100	1.1	6.0	6.0	11	7.1
100 – 200	2	2	100	0.43	3.1	3.1	5.8	3.8
200 – 300	2	2	100	0.012	0.90	0.90	1.8	1.3
300 – 400	1	1	100	1.1	--	--	1.1	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--

Table 4-12
Total PCBs in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
CM 0 – 1								
15 – 60	20	20	100	0.011	0.85	1.2	5.3	1.2
60 – 100	18	18	100	0.0010	0.56	1.3	6.1	1.6
100 – 200	16	15	94	0.0016	1.5	2.5	8.1	2.5
200 – 300	11	11	100	0.096	1.1	2.0	6.8	2.1
300 – 400	4	3	75	0.0028	0.44	0.47	0.98	0.53
400 – 500	2	1	50	0.0026	--	--	1.5	--
500 – 600	0	0	--	--	--	--	--	--
CM 1 – 2								
15 – 60	22	22	100	0.68	3.0	4.7	30	6.1
60 – 100	21	21	100	0.18	4.2	6.6	25	6.6
100 – 200	21	20	95	0.0061	4.1	5.4	16	5.2
200 – 300	9	6	67	0.0028	0.30	1.3	8.1	2.6
300 – 400	2	0	0	0.000088	--	--	0.0021	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--
CM 2+								
15 – 60	68	67	99	0.058	17	28	150	29
60 – 100	46	46	100	7.3e-06	19	33	190	42
100 – 200	43	42	98	0.061	16	26	180	37
200 – 300	32	28	88	0.021	6.9	15	86	21
300 – 400	16	16	100	0.028	3.1	5.0	18	6.0
400 – 500	6	5	83	0.027	0.20	1.3	6.1	2.4
500 – 600	3	1	33	0.0027	--	--	8.4	--

Notes:

Units are milligrams per kilogram. Totals reported using Kaplan-Meier, if applicable.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes only subsurface sediment samples from cores that were sampled continuously.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

cm = centimeter

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-13
Copper in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
English Kills								
15 – 60	26	26	100	180	1,800	2,100	6,400	1,600
60 – 100	25	25	100	18	2,900	3,000	6,600	1,700
100 – 200	23	23	100	17	3,100	3,300	7,600	2,000
200 – 300	20	20	100	14	4,100	4,000	7,100	2,000
300 – 400	10	10	100	12	4,300	3,600	6,600	2,200
400 – 500	2	2	100	3,400	4,900	4,900	6,500	2,100
500 – 600	0	0	--	--	--	--	--	--
East Branch								
15 – 60	12	12	100	230	1,200	1,600	4,900	1,300
60 – 100	11	11	100	180	2,300	2,100	4,700	1,600
100 – 200	12	12	100	320	2,000	2,500	6,000	2,000
200 – 300	12	12	100	380	1,900	2,100	5,200	1,600
300 – 400	8	8	100	190	1,800	2,300	5,400	1,700
400 – 500	6	6	100	980	1,600	2,200	4,000	1,300
500 – 600	1	1	100	1,200	--	--	1,200	--
Maspeth Creek								
15 – 60	5	5	100	500	3,200	3,400	8,900	3,400
60 – 100	5	5	100	420	5,200	3,800	6,000	2,400
100 – 200	4	4	100	500	6,000	4,900	7,200	3,000
200 – 300	4	4	100	550	9,800	7,700	11,000	4,800
300 – 400	4	4	100	630	9,700	7,900	11,000	5,000
400 – 500	3	3	100	2,700	4,000	6,400	13,000	5,400
500 – 600	1	1	100	3,200	--	--	3,200	--
Dutch Kills								
15 – 60	11	11	100	120	1,200	1,100	1,900	660
60 – 100	10	10	100	150	1,900	1,500	2,300	750
100 – 200	11	11	100	200	1,800	1,600	3,100	1,000
200 – 300	9	9	100	350	1,400	1,500	4,200	1,200
300 – 400	5	5	100	340	1,300	1,300	2,700	850
400 – 500	3	3	100	46	470	530	1,100	510
500 – 600	0	0	--	--	--	--	--	--
Whale Creek								
15 – 60	2	2	100	420	910	910	1,400	690
60 – 100	2	2	100	1,400	2,100	2,100	2,700	930
100 – 200	2	2	100	1,100	1,700	1,700	2,200	750
200 – 300	2	2	100	200	1,200	1,200	2,300	1,500
300 – 400	1	1	100	1,100	--	--	1,100	--
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--

Table 4-13
Copper in Subsurface Sediment – Summary Statistics

Depth (cm)	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
CM 0 – 1								
15 – 60	20	20	100	97	230	280	1,000	210
60 – 100	18	18	100	9.3	240	350	1,300	330
100 – 200	16	16	100	230	550	600	1,300	300
200 – 300	11	11	100	110	490	440	860	240
300 – 400	4	4	100	23	310	300	560	270
400 – 500	2	2	100	58	360	360	660	430
500 – 600	0	0	--	--	--	--	--	--
CM 1 – 2								
15 – 60	22	22	100	260	1,300	1,300	3,500	870
60 – 100	21	21	100	610	1,600	2,000	6,000	1,300
100 – 200	21	21	100	37	1,900	2,300	5,600	1,500
200 – 300	9	9	100	860	1,400	1,900	4,000	1,100
300 – 400	2	2	100	69	150	150	230	110
400 – 500	0	0	--	--	--	--	--	--
500 – 600	0	0	--	--	--	--	--	--
CM 2+								
15 – 60	68	68	100	42	5,700	9,100	170,000	20,000
60 – 100	46	46	100	20	7,800	10,000	51,000	8,200
100 – 200	43	43	100	1,100	8,700	8,600	32,000	5,300
200 – 300	32	32	100	36	6,100	6,300	16,000	4,700
300 – 400	16	16	100	65	3,300	5,100	23,000	6,300
400 – 500	6	6	100	99	2,900	7,600	27,000	10,000
500 – 600	3	3	100	270	2,300	4,400	11,000	5,500

Notes:

Units are milligrams per kilogram. Totals reported using Kaplan-Meier, if applicable.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes only subsurface sediment samples from cores that were sampled continuously.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

cm = centimeter

MDL = method detection limit

Table 4-14
Gross Solids Deposition (Mass) in Sediment Traps –
Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	4	NA	NA	2.8	3.4	4.8	9.6	3.2
	East Branch	2	NA	NA	1.9	11	11	20	13
	Maspeth Creek	3	NA	NA	14	27	57	130	64
	Dutch Kills	3	NA	NA	2.6	7.0	12	28	13
	Whale Creek	1	NA	NA	18	--	--	18	--
Main Stem	CM 0 – 1	4	NA	NA	22	36	38	58	17
	CM 1 – 2	6	NA	NA	4.7	18	57	260	100
	CM 2+	7	NA	NA	2.2	6.2	7.3	20	6.0
Study Area – Quarter 2									
Tributaries	English Kills	4	NA	NA	1.3	2.9	3.0	4.8	1.6
	East Branch	2	NA	NA	0.80	5.6	5.6	10	6.8
	Maspeth Creek	3	NA	NA	4.1	4.1	6.8	12	4.7
	Dutch Kills	3	NA	NA	1.3	19	18	35	17
	Whale Creek	1	NA	NA	320	--	--	320	--
Main Stem	CM 0 – 1	4	NA	NA	31	58	57	81	24
	CM 1 – 2	6	NA	NA	2.4	18	55	240	91
	CM 2+	7	NA	NA	1.4	3.5	4.1	7.3	2.2
Study Area – Quarter 3									
Tributaries	English Kills	3	NA	NA	6.4	30	37	75	35
	East Branch	2	NA	NA	6.6	12	12	18	8.1
	Maspeth Creek	2	NA	NA	9.1	14	14	19	7.4
	Dutch Kills	2	NA	NA	23	31	31	39	11
	Whale Creek	1	NA	NA	130	--	--	130	--
Main Stem	CM 0 – 1	2	NA	NA	36	38	38	40	2.8
	CM 1 – 2	6	NA	NA	4.7	14	40	160	60
	CM 2+	7	NA	NA	2.1	22	28	87	30
Study Area – All Quarters, Combined									
Tributaries	English Kills	11	NA	NA	1.3	4.0	13	75	22
	East Branch	6	NA	NA	0.80	8.5	9.6	20	8.1
	Maspeth Creek	8	NA	NA	4.1	13	28	130	42
	Dutch Kills	8	NA	NA	1.3	21	19	39	14
	Whale Creek	3	NA	NA	18	130	160	320	150
Main Stem	CM 0 – 1	10	NA	NA	22	40	45	81	20
	CM 1 – 2	18	NA	NA	2.4	17	51	260	81
	CM 2+	21	NA	NA	1.4	6.2	13	87	20

Table 4-14
Gross Solids Deposition (Mass) in Sediment Traps –
Summary Statistics

Notes:

Units are milligrams per square centimeter per day.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

NA = not applicable

Table 4-15
Percent Fines in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	8.2	77	67	91	34
	East Branch	3	3	100	12	62	55	91	40
	Maspeth Creek	3	3	100	12	48	37	50	21
	Dutch Kills	3	3	100	85	86	87	90	2.4
	Whale Creek	1	1	100	51	--	--	51	--
Main Stem	CM 0 – 1	4	4	100	83	86	86	89	3.2
	CM 1 – 2	6	6	100	52	85	78	96	20
	CM 2+	7	7	100	60	89	82	98	15
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	77	89	88	95	8.0
	East Branch	2	2	100	35	67	67	100	46
	Maspeth Creek	3	3	100	63	70	69	74	5.7
	Dutch Kills	3	3	100	82	90	88	92	5.4
	Whale Creek	1	1	100	84	--	--	84	--
Main Stem	CM 0 – 1	4	4	100	82	88	87	89	3.5
	CM 1 – 2	6	6	100	57	90	82	99	18
	CM 2+	7	7	100	77	94	91	98	7.8
Study Area – Quarter 3									
Tributaries	English Kills	4	4	100	57	83	78	88	14
	East Branch	2	2	100	36	53	53	71	25
	Maspeth Creek	3	3	100	76	85	85	94	9.2
	Dutch Kills	2	2	100	91	93	93	95	3.0
	Whale Creek	1	1	100	37	--	--	37	--
Main Stem	CM 0 – 1	3	3	100	81	87	87	94	6.7
	CM 1 – 2	6	6	100	81	95	93	97	6.0
	CM 2+	7	7	100	70	91	89	98	9.3
Study Area – All Quarters, Combined									
Tributaries	English Kills	13	13	100	8.2	84	77	95	23
	East Branch	7	7	100	12	62	58	100	32
	Maspeth Creek	9	9	100	12	70	63	94	24
	Dutch Kills	8	8	100	82	90	89	95	4.3
	Whale Creek	3	3	100	37	51	57	84	24
Main Stem	CM 0 – 1	11	11	100	81	87	87	94	4.0
	CM 1 – 2	18	18	100	52	94	84	99	16
	CM 2+	21	21	100	60	91	87	98	11

Table 4-15
Percent Fines in Sediment Traps – Summary Statistics

Notes:

Units are weight percent, dry basis.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-16
Total Organic Carbon in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	2.2	7.1	6.6	11	3.7
	East Branch	3	3	100	2.9	5.6	4.8	5.9	1.7
	Maspeth Creek	3	3	100	2.5	9.0	8.2	13	5.3
	Dutch Kills	3	3	100	4.9	5.8	6.5	8.9	2.1
	Whale Creek	1	1	100	4.1	--	--	4.1	--
Main Stem	CM 0 – 1	4	4	100	4.0	4.0	4.0	4.1	0.052
	CM 1 – 2	6	6	100	2.7	5.2	4.9	6.1	1.3
	CM 2+	7	7	100	3.4	6.2	6.3	8.8	2.1
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	6.0	8.3	7.7	8.4	1.2
	East Branch	2	2	100	11	12	12	13	1.5
	Maspeth Creek	3	3	100	9.3	9.5	10	11	0.98
	Dutch Kills	3	3	100	3.3	4.9	5.7	8.9	2.9
	Whale Creek	1	1	100	3.2	--	--	3.2	--
Main Stem	CM 0 – 1	4	4	100	4.0	4.4	4.4	4.7	0.36
	CM 1 – 2	6	6	100	4.3	5.5	5.6	8.3	1.5
	CM 2+	7	7	100	3.5	6.9	7.1	12	2.5
Study Area – Quarter 3									
Tributaries	English Kills	3	3	100	11	12	12	13	0.95
	East Branch	2	2	100	12	13	13	14	1.5
	Maspeth Creek	2	2	100	15	15	15	16	0.42
	Dutch Kills	2	2	100	4.7	7.1	7.1	9.5	3.3
	Whale Creek	1	1	100	2.4	--	--	2.4	--
Main Stem	CM 0 – 1	2	2	100	4.2	4.4	4.4	4.6	0.24
	CM 1 – 2	6	6	100	4.1	4.7	4.9	6.9	1.0
	CM 2+	7	7	100	6.4	8.3	7.9	9.2	1.1
Study Area – All Quarters, Combined									
Tributaries	English Kills	12	12	100	2.2	8.4	8.4	13	3.4
	East Branch	7	7	100	2.9	11	9.4	14	4.5
	Maspeth Creek	8	8	100	2.5	10	11	16	4.1
	Dutch Kills	8	8	100	3.3	5.4	6.4	9.5	2.4
	Whale Creek	3	3	100	2.4	3.2	3.3	4.1	0.84
Main Stem	CM 0 – 1	10	10	100	4.0	4.1	4.2	4.7	0.29
	CM 1 – 2	18	18	100	2.7	4.9	5.2	8.3	1.3
	CM 2+	21	21	100	3.4	7.0	7.1	12	2.0

Table 4-16
Total Organic Carbon in Sediment Traps – Summary Statistics

Notes:

Units are weight percent.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-17
Percent Solids in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	4.0	13	17	40	14
	East Branch	3	3	100	8.2	12	24	53	25
	Maspeth Creek	3	3	100	13	18	30	59	26
	Dutch Kills	3	3	100	8.0	13	18	32	13
	Whale Creek	1	1	100	10	--	--	10	--
Main Stem	CM 0 – 1	4	4	100	26	27	28	32	2.6
	CM 1 – 2	6	6	100	12	24	23	40	10
	CM 2+	7	7	100	4.2	11	16	29	9.6
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	3.3	5.3	5.5	7.9	2.1
	East Branch	2	2	100	3.1	4.2	4.2	5.2	1.5
	Maspeth Creek	3	3	100	5.1	7.4	7.2	9.3	2.1
	Dutch Kills	3	3	100	4.5	9.3	14	28	13
	Whale Creek	1	1	100	46	--	--	46	--
Main Stem	CM 0 – 1	4	4	100	27	28	30	38	5.2
	CM 1 – 2	6	6	100	14	22	23	36	7.5
	CM 2+	7	7	100	3.3	6.7	9.8	19	5.9
Study Area – Quarter 3									
Tributaries	English Kills	3	3	100	6.0	12	14	24	9.1
	East Branch	2	2	100	5.5	7.4	7.4	9.2	2.6
	Maspeth Creek	2	2	100	8.5	11	11	13	3.1
	Dutch Kills	2	2	100	17	19	19	21	3.0
	Whale Creek	1	1	100	42	--	--	42	--
Main Stem	CM 0 – 1	2	2	100	21	22	22	24	1.5
	CM 1 – 2	6	6	100	13	18	21	40	10
	CM 2+	7	7	100	8.7	17	17	24	5.5
Study Area – All Quarters, Combined									
Tributaries	English Kills	12	12	100	3.3	7.9	13	40	11
	East Branch	7	7	100	3.1	8.2	14	53	18
	Maspeth Creek	8	8	100	5.1	11	17	59	18
	Dutch Kills	8	8	100	4.5	15	17	32	9.8
	Whale Creek	3	3	100	10	42	33	46	20
Main Stem	CM 0 – 1	10	10	100	21	27	28	38	4.5
	CM 1 – 2	18	18	100	12	21	22	40	8.9
	CM 2+	21	21	100	3.3	12	14	29	7.5

Table 4-17
Percent Solids in Sediment Traps – Summary Statistics

Notes:

Units are weight percent.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

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Table 4-18
Total PAH (17) in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	5.7	35	65	150	59
	East Branch	3	3	100	5.6	24	18	25	11
	Maspeth Creek	3	3	100	9.1	9.9	13	20	6.2
	Dutch Kills	3	3	100	8.4	12	25	56	27
	Whale Creek	1	1	100	97	--	--	97	--
Main Stem	CM 0 – 1	4	4	100	7.7	11	17	37	13
	CM 1 – 2	6	6	100	5.3	14	15	23	7.0
	CM 2+	7	7	100	3.5	11	17	44	14
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	69	130	180	400	150
	East Branch	2	2	100	87	130	130	170	60
	Maspeth Creek	3	3	100	100	110	110	110	5.2
	Dutch Kills	3	3	100	28	58	72	130	53
	Whale Creek	1	1	100	20	--	--	20	--
Main Stem	CM 0 – 1	4	4	100	12	16	17	24	5.3
	CM 1 – 2	6	6	100	22	30	32	48	11
	CM 2+	7	7	100	33	63	65	120	31
Study Area – Quarter 3									
Tributaries	English Kills	3	3	100	37	90	78	110	36
	East Branch	2	2	100	22	50	50	78	39
	Maspeth Creek	2	2	100	17	28	28	38	15
	Dutch Kills	2	2	100	14	16	16	19	3.3
	Whale Creek	1	1	100	24	--	--	24	--
Main Stem	CM 0 – 1	2	2	100	13	16	16	19	4.2
	CM 1 – 2	6	6	100	19	20	23	30	4.4
	CM 2+	7	7	100	31	42	44	68	13
Study Area – All Quarters, Combined									
Tributaries	English Kills	12	12	100	5.7	95	110	400	100
	East Branch	7	7	100	5.6	25	59	170	58
	Maspeth Creek	8	8	100	9.1	29	53	110	48
	Dutch Kills	8	8	100	8.4	23	41	130	41
	Whale Creek	3	3	100	20	24	47	97	43
Main Stem	CM 0 – 1	10	10	100	7.7	14	17	37	8.4
	CM 1 – 2	18	18	100	5.3	22	23	48	10
	CM 2+	21	21	100	3.5	41	42	120	28

Table 4-18
Total PAH (17) in Sediment Traps – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-19
Total PCBs in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	0.73	2.7	4.3	11	4.2
	East Branch	3	3	100	0.13	0.16	0.81	2.1	1.1
	Maspeth Creek	3	3	100	0.25	0.96	0.96	1.7	0.71
	Dutch Kills	3	3	100	0.83	1.5	1.4	1.9	0.56
	Whale Creek	1	1	100	1.9	--	--	1.9	--
Main Stem	CM 0 – 1	4	4	100	0.46	0.51	0.52	0.58	0.060
	CM 1 – 2	6	6	100	0.76	0.88	0.89	1.0	0.099
	CM 2+	7	7	100	1.2	1.7	1.9	4.1	1.0
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	1.9	4.8	6.7	15	5.9
	East Branch	2	2	100	0.16	1.2	1.2	2.2	1.5
	Maspeth Creek	3	3	100	1.1	1.4	10	28	15
	Dutch Kills	3	3	100	1.1	1.2	9.7	27	15
	Whale Creek	1	1	100	2.5	--	--	2.5	--
Main Stem	CM 0 – 1	4	4	100	0.41	0.52	0.54	0.71	0.13
	CM 1 – 2	6	6	100	0.79	1.0	0.99	1.2	0.14
	CM 2+	7	7	100	1.4	1.7	2.6	5.4	1.5
Study Area – Quarter 3									
Tributaries	English Kills	3	3	100	2.5	11	9.5	15	6.3
	East Branch	2	2	100	0.18	0.86	0.86	1.5	0.96
	Maspeth Creek	2	2	100	0.44	0.87	0.87	1.3	0.61
	Dutch Kills	2	2	100	1.3	1.4	1.4	1.4	0.091
	Whale Creek	1	1	100	1.1	--	--	1.1	--
Main Stem	CM 0 – 1	2	2	100	0.47	0.51	0.51	0.55	0.060
	CM 1 – 2	6	6	100	0.80	1.2	1.2	1.6	0.29
	CM 2+	7	7	100	1.5	1.8	2.3	5.0	1.2
Study Area – All Quarters, Combined									
Tributaries	English Kills	12	12	100	0.73	4.4	6.4	15	5.3
	East Branch	7	7	100	0.13	0.18	0.94	2.2	0.99
	Maspeth Creek	8	8	100	0.25	1.2	4.4	28	9.6
	Dutch Kills	8	8	100	0.83	1.4	4.5	27	9.0
	Whale Creek	3	3	100	1.1	1.9	1.8	2.5	0.69
Main Stem	CM 0 – 1	10	10	100	0.41	0.51	0.53	0.71	0.086
	CM 1 – 2	18	18	100	0.76	1.0	1.0	1.6	0.23
	CM 2+	21	21	100	1.2	1.7	2.3	5.4	1.2

Table 4-19
Total PCBs in Sediment Traps – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-20
Copper in Sediment Traps – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area – Quarter 1									
Tributaries	English Kills	5	5	100	200	780	710	1,500	500
	East Branch	3	3	100	85	130	140	210	63
	Maspeth Creek	3	3	100	130	290	360	670	280
	Dutch Kills	3	3	100	130	130	190	310	100
	Whale Creek	1	1	100	1,400	--	--	1,400	--
Main Stem	CM 0 – 1	4	4	100	110	160	160	210	44
	CM 1 – 2	6	6	100	200	330	330	500	120
	CM 2+	7	7	100	63	400	780	1,900	750
Study Area – Quarter 2									
Tributaries	English Kills	4	4	100	76	180	960	3,400	1,600
	East Branch	2	2	100	43	120	120	210	120
	Maspeth Creek	3	3	100	55	230	290	590	270
	Dutch Kills	3	3	100	310	310	360	470	91
	Whale Creek	1	1	100	340	--	--	340	--
Main Stem	CM 0 – 1	4	4	100	100	120	120	150	23
	CM 1 – 2	6	6	100	260	300	300	380	44
	CM 2+	7	7	100	100	400	360	610	170
Study Area – Quarter 3									
Tributaries	English Kills	3	3	100	74	550	740	1,600	770
	East Branch	2	2	100	20	25	25	29	6.5
	Maspeth Creek	2	2	100	190	280	280	370	130
	Dutch Kills	2	2	100	150	220	220	290	100
	Whale Creek	1	1	100	260	--	--	260	--
Main Stem	CM 0 – 1	2	2	100	75	75	75	75	0.28
	CM 1 – 2	6	6	100	220	280	300	400	64
	CM 2+	7	7	100	370	620	980	3,400	1,100
Study Area – All Quarters, Combined									
Tributaries	English Kills	12	12	100	74	420	800	3,400	970
	East Branch	7	7	100	20	85	100	210	80
	Maspeth Creek	8	8	100	55	260	310	670	220
	Dutch Kills	8	8	100	130	300	260	470	120
	Whale Creek	3	3	100	260	340	660	1,400	620
Main Stem	CM 0 – 1	10	10	100	75	120	130	210	43
	CM 1 – 2	18	18	100	200	290	310	500	78
	CM 2+	21	21	100	63	410	710	3,400	770

Table 4-20
Copper in Sediment Traps – Summary Statistics

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Quarter 1 = 6/13/2014 to 9/15/2014

Quarter 2 = 9/15/2014 to 12/15/2014

Quarter 3 = 12/15/2014 to 3/23/2015

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

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Table 4-21
Total PAH (17) in Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	64	63	98	0.064	0.19	0.27	1.2	0.22
	East Branch	14	14	100	0.081	0.17	0.20	0.55	0.12
	Maspeth Creek	15	15	100	0.071	0.15	0.16	0.29	0.067
	Dutch Kills	52	49	94	0.0013	0.14	0.16	0.52	0.11
	Whale Creek	25	25	100	0.054	0.16	0.16	0.39	0.083
Main Stem	CM 0 – 1	56	50	89	0.0023	0.11	0.13	0.66	0.10
	CM 1 – 2	60	59	98	0.0021	0.13	0.15	0.49	0.088
	CM 2+	76	76	100	0.0019	0.14	0.17	0.83	0.12
Reference Areas									
Industrial/CSO	Westchester Creek	8	8	100	0.086	0.12	0.18	0.43	0.12
Industrial/Non-CSO	Head of Bay	8	4	50	0.002	0.015	0.015	0.029	0.013
Non-Industrial/CSO	Spring Creek	7	3	43	0.028	0.033	0.11	0.33	0.13
Non-Industrial/Non-CSO	Gerritsen Creek	8	3	38	0.0036	0.027	0.023	0.040	0.013

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-22
Total PCB Congeners in Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	2	100	16	17	17	18	1.7
	East Branch	2	2	100	5.5	8.0	8.0	11	3.6
	Maspeth Creek	3	3	100	3.1	8.7	7.0	9.1	3.4
	Dutch Kills	4	4	100	5.8	6.0	6.1	6.4	0.30
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	32	32	100	2.4	6.7	6.8	12	2.3
	CM 1 – 2	28	27	96	0.66	6.3	6.6	18	3.8
	CM 2+	52	51	98	2.7	7.1	9.5	92	12
Reference Areas									
Industrial/CSO	Westchester Creek	8	8	100	1.7	2.6	2.7	4.9	1.2
Industrial/Non-CSO	Head of Bay	8	5	62	0.25	0.32	0.39	0.73	0.17
Non-Industrial/CSO	Spring Creek	7	5	71	0.35	0.52	0.57	0.89	0.16
Non-Industrial/Non-CSO	Gerritsen Creek	8	5	62	0.28	0.79	0.82	1.3	0.33

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-23
Total PCB Aroclors in Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	62	20	32	2.8	2.9	16	190	29
	East Branch	12	0	0	2.8	--	--	28	--
	Maspeth Creek	12	1	8	2.8	--	--	28	--
	Dutch Kills	48	5	10	2.8	2.8	6.2	41	9.1
	Whale Creek	25	5	20	2.8	2.8	5.9	28	7.1
Main Stem	CM 0 – 1	48	3	6	2.8	2.8	5.0	35	6.9
	CM 1 – 2	56	9	16	2.8	2.8	8.1	72	14
	CM 2+	72	12	17	2.8	2.8	7.1	95	13

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-24
Copper in Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	64	40	62	1.0	3.2	3.5	12	1.8
	East Branch	14	9	64	1.0	3.2	4.5	23	5.4
	Maspeth Creek	15	8	53	2.0	4.0	3.8	5.1	1.2
	Dutch Kills	52	27	52	0.1	2.8	3.5	22	3.3
	Whale Creek	25	22	88	1.9	3.7	5.0	17	3.6
Main Stem	CM 0 – 1	56	41	73	1.1	4.0	4.3	17	2.6
	CM 1 – 2	60	40	67	0.1	4.7	4.4	13	2.3
	CM 2+	76	50	66	1.0	4.2	6.2	90	11
Reference Areas									
Industrial/CSO	Westchester Creek	8	5	62	4.0	5.1	5.2	7.8	1.3
Industrial/Non-CSO	Head of Bay	8	1	12	2.0	--	--	4.0	--
Non-Industrial/CSO	Spring Creek	7	3	43	2.3	4.0	3.5	4.0	0.67
Non-Industrial/Non-CSO	Gerritsen Creek	8	0	0	2.0	--	--	4.0	--

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

Table 4-25
Total PAH (17) in Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	32	32	100	0.096	0.41	0.62	3.3	0.63
	East Branch	32	32	100	0.078	0.45	0.60	1.7	0.42
	Maspeth Creek	10	10	100	0.17	0.47	0.74	2.5	0.73
	Dutch Kills	18	18	100	0.16	0.40	0.75	4.1	0.92
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	40	40	100	0.10	0.21	0.25	0.82	0.14
	CM 1 – 2	20	20	100	0.11	0.26	0.44	2.2	0.48
	CM 2+	40	40	100	0.10	0.30	0.41	1.2	0.30

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-26
Total PCB Congeners in Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	32	32	100	2.7	21	23	57	13
	East Branch	32	32	100	2.4	14	14	30	5.8
	Maspeth Creek	10	10	100	4.5	11	11	20	4.8
	Dutch Kills	18	18	100	3.0	6.7	8.5	34	7.1
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	40	40	100	3.0	7.8	11	120	18
	CM 1 – 2	20	20	100	4.5	13	14	46	8.8
	CM 2+	40	40	100	5.0	13	16	61	11

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-27
Copper in Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	32	23	72	2.0	7.7	7.6	21	5.1
	East Branch	32	22	69	2.0	7.3	7.4	20	4.9
	Maspeth Creek	10	8	80	2.0	8.8	8.2	14	4.6
	Dutch Kills	18	12	67	2.0	4.8	8.0	26	7.6
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 - 1	40	28	70	2.0	4.6	4.9	12	2.8
	CM 1 - 2	20	15	75	2.0	6.3	6.2	15	3.7
	CM 2+	40	31	78	2.0	7.0	10	110	18

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-28
Estimated Total PAH (17) Particulate Phase Concentrations in
Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	64	63	98	0.91	4.5	5.2	18	3.2
	East Branch	14	14	100	1.1	3.4	4.0	7.9	2.0
	Maspeth Creek	15	15	100	0.95	3.6	3.4	6.5	1.5
	Dutch Kills	52	49	94	0.40	2.7	3.6	21	3.1
	Whale Creek	25	25	100	0.96	3.7	3.4	7.5	1.7
Main Stem	CM 0 – 1	56	50	89	0.49	2.9	3.1	8.0	1.5
	CM 1 – 2	60	59	98	0.53	3.3	3.5	11	1.9
	CM 2+	76	76	100	0.55	3.5	4.4	27	4.0
Reference Areas									
Industrial/CSO	Westchester Creek	8	8	100	1.9	3.3	4.4	9.6	2.8
Industrial/Non-CSO	Head of Bay	8	4	50	0.35	0.47	0.57	0.86	0.23
Non-Industrial/CSO	Spring Creek	7	3	43	0.44	1.3	2.2	8.8	3.0
Non-Industrial/Non-CSO	Gerritsen Creek	8	3	38	0.33	0.52	0.58	1.1	0.23

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

PAH = polycyclic aromatic hydrocarbon

Table 4-29
Estimated Total PAH (17) Particulate Phase Concentrations in
Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	32	32	100	2.2	16	17	77	13
	East Branch	32	32	100	2.6	14	17	45	11
	Maspeth Creek	10	10	100	6.7	14	21	63	17
	Dutch Kills	18	18	100	4.5	11	15	48	11
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	39	39	100	2.5	5.2	6.9	25	4.3
	CM 1 – 2	20	20	100	2.3	8.4	12	53	12
	CM 2+	38	38	100	2.4	9.5	14	36	9.0

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

PAH = polycyclic aromatic hydrocarbon

Table 4-30
Estimated Total PCB Congener Particulate Phase Concentrations in
Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	2	100	0.46	0.49	0.49	0.51	0.040
	East Branch	2	2	100	0.17	0.23	0.23	0.29	0.087
	Maspeth Creek	3	3	100	0.11	0.24	0.20	0.27	0.085
	Dutch Kills	4	4	100	0.047	0.25	0.26	0.51	0.20
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	32	32	100	0.066	0.20	0.22	0.50	0.10
	CM 1 – 2	28	27	96	0.029	0.23	0.24	0.48	0.13
	CM 2+	52	51	98	0.065	0.30	0.42	4.3	0.61
Reference Areas									
Industrial/CSO	Westchester Creek	8	8	100	0.042	0.11	0.10	0.18	0.056
Industrial/Non-CSO	Head of Bay	8	5	62	0.0058	0.0096	0.015	0.034	0.011
Non-Industrial/CSO	Spring Creek	7	5	71	0.0074	0.022	0.020	0.025	0.0065
Non-Industrial/Non-CSO	Gerritsen Creek	8	5	62	0.0063	0.020	0.028	0.050	0.017

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

PCB = polychlorinated biphenyl

Table 4-31
Estimated Total PCB Congener Particulate Phase Concentrations in
Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	32	32	100	0.078	1.0	1.2	3.4	0.85
	East Branch	32	32	100	0.087	0.62	0.71	1.9	0.45
	Maspeth Creek	10	10	100	0.23	0.48	0.50	0.86	0.22
	Dutch Kills	18	18	100	0.14	0.33	0.36	0.69	0.14
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	39	39	100	0.14	0.29	0.51	4.8	0.76
	CM 1 – 2	20	20	100	0.11	0.58	0.57	1.4	0.30
	CM 2+	38	38	100	0.13	0.70	0.82	2.4	0.51

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

PCB = polychlorinated biphenyl

Table 4-32
Calculated Copper Particulate Phase Concentrations in
Surface Water During Dry Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	38	38	100	20	110	140	860	150
	East Branch	9	8	89	19	81	140	490	150
	Maspeth Creek	9	8	89	50	130	140	280	87
	Dutch Kills	25	23	92	9.1	91	110	390	100
	Whale Creek	19	19	100	21	80	100	250	66
Main Stem	CM 0 – 1	36	36	100	21	82	120	530	110
	CM 1 – 2	38	36	95	8.9	98	120	430	86
	CM 2+	51	48	94	18	130	310	5,200	750
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	87	100	130	200	54
Industrial/Non-CSO	Head of Bay	1	1	100	5.9	--	--	5.9	--
Non-Industrial/CSO	Spring Creek	1	1	100	48	--	--	48	--
Non-Industrial/Non-CSO	Gerritsen Creek	0	0	--	--	--	--	--	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Results where dissolved fraction is greater than total fraction not included.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

Table 4-33
Calculated Copper Particulate Phase Concentrations in
Surface Water During Wet Weather – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	24	23	96	36	360	510	3,100	620
	East Branch	23	22	96	55	410	400	780	210
	Maspeth Creek	7	7	100	190	380	470	850	250
	Dutch Kills	11	11	100	67	480	350	730	230
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	25	25	100	14	120	150	360	120
	CM 1 – 2	15	15	100	18	240	240	580	160
	CM 2+	25	25	100	79	430	860	9,200	1,800

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Samples with non-detected total suspended solids not included.

Results where dissolved fraction is greater than total fraction not included.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

Table 4-34
Salinity in Shallow Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	6	6	100	11	16	16	21	3.9
	East Branch	2	2	100	12	12	12	12	0
	Maspeth Creek	3	3	100	13	14	15	18	2.6
	Dutch Kills	3	3	100	3.7	17	14	20	8.7
	Whale Creek	2	2	100	20	21	21	22	1.4
Main Stem	CM 0 – 1	7	7	100	20	21	21	22	0.76
	CM 1 – 2	7	7	100	16	20	20	22	1.9
	CM 2+	6	6	100	12	17	16	20	2.9
Reference Areas									
Industrial/CSO	Westchester Creek	6	6	100	22	22	22	23	0.41
Industrial/Non-CSO	Head of Bay	6	6	100	25	26	26	26	0.52
Non-Industrial/CSO	Spring Creek	6	6	100	16	22	21	23	2.7
Non-Industrial/Non-CSO	Gerritsen Creek	6	6	100	24	27	26	28	1.5

Notes:

Units are practical salinity unit (psu).

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes combined results from 0 – 15 centimeter and 15 – 30 centimeter intervals from Triad program porewater and Groundwater program porewater.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

Table 4-35
Total PAH (17) in Shallow Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	12	12	100	0.47	3.6	12	52	16
	East Branch	6	5	83	0.59	1.1	1.3	2.9	0.84
	Maspeth Creek	3	1	33	0.79	--	--	2.5	--
	Dutch Kills	7	6	86	0.81	1.1	7.0	26	10
	Whale Creek	2	2	100	1.2	1.7	1.7	2.2	0.73
Main Stem	CM 0 – 1	8	6	75	0.035	0.29	0.60	2.7	0.91
	CM 1 – 2	13	10	77	0.06	0.22	0.24	0.50	0.14
	CM 2+	14	13	93	0.34	1.8	4.4	22	6.2
Reference Areas									
Industrial/CSO	Westchester Creek	6	2	33	0.03	0.49	0.64	1.8	0.60
Industrial/Non-CSO	Head of Bay	6	2	33	0.035	0.28	0.27	0.46	0.16
Non-Industrial/CSO	Spring Creek	6	2	33	0.03	0.2	0.26	0.52	0.18
Non-Industrial/Non-CSO	Gerritsen Creek	6	3	50	0.065	0.2	0.30	0.69	0.22

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes combined results from 0 – 15 centimeter and 15 – 30 centimeter intervals from Triad program porewater and Groundwater program porewater.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-36
Total PCBs in Shallow Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	12	12	100	25	79	140	470	140
	East Branch	6	6	100	3.1	6.5	7.5	16	5.2
	Maspeth Creek	3	3	100	2.6	2.8	4.3	7.4	2.7
	Dutch Kills	7	7	100	2.6	7.8	6.5	11	3.4
	Whale Creek	2	2	100	13	14	14	15	1.8
Main Stem	CM 0 – 1	9	9	100	4.2	6.3	6.3	9.0	1.4
	CM 1 – 2	13	13	100	3.8	6.0	6.1	9.2	1.8
	CM 2+	14	14	100	7.0	36	43	110	32
Reference Areas									
Industrial/CSO	Westchester Creek	6	6	100	0.67	1.8	1.7	2.1	0.52
Industrial/Non-CSO	Head of Bay	6	6	100	0.44	0.65	0.87	2.3	0.69
Non-Industrial/CSO	Spring Creek	6	6	100	0.37	0.96	0.93	1.4	0.36
Non-Industrial/Non-CSO	Gerritsen Creek	6	6	100	0.79	1.1	1.1	1.3	0.22

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes combined results from 0 – 15 centimeter and 15 – 30 centimeter intervals from Triad program porewater and Groundwater program porewater.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 4-37
Dissolved Copper in Shallow Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	12	7	58	0.32	4.0	5.8	18	5.2
	East Branch	6	2	33	0.32	4.0	4.1	8.2	3.5
	Maspeth Creek	3	2	67	0.32	0.42	1.4	3.3	1.7
	Dutch Kills	7	5	71	0.32	5.0	4.2	8.4	3.3
	Whale Creek	2	2	100	1.7	3.5	3.5	5.4	2.6
Main Stem	CM 0 – 1	13	11	85	0.32	4.4	3.8	9.0	3.0
	CM 1 – 2	13	10	77	0.32	3.0	4.7	16	4.6
	CM 2+	14	12	86	0.32	8.6	9.0	17	5.0
Reference Areas									
Industrial/CSO	Westchester Creek	6	2	33	0.32	0.32	0.47	0.99	0.27
Industrial/Non-CSO	Head of Bay	6	2	33	0.32	0.32	1.1	2.6	1.1
Non-Industrial/CSO	Spring Creek	6	6	100	0.6	1.1	0.98	1.3	0.28
Non-Industrial/Non-CSO	Gerritsen Creek	6	6	100	0.32	0.99	1.3	3.5	1.1

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Table includes combined results from 0 – 15 centimeter and 15 – 30 centimeter intervals from Triad program porewater and Groundwater program porewater.

Totals reported using Kaplan-Meier, if applicable.

Triad metals plotted from peeper analysis, except mercury which is plotted from centrifuge analysis.

Acronyms:

CM = creek mile

CSO = combined sewer overflow

MDL = method detection limit

Table 4-38
Salinity in Mid-Depth Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	1	1	100	15	--	--	15	--
	East Branch	1	1	100	12	--	--	12	--
	Maspeth Creek	0	0	--	--	--	--	--	--
	Dutch Kills	2	2	100	17	20	20	22	3.5
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	3	3	100	21	22	22	22	0.58
	CM 1 – 2	3	3	100	11	21	18	22	6.1
	CM 2+	2	2	100	17	19	19	21	2.8

Notes:

Units are practical salinity units (psu).

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-39
TSS in Mid-Depth Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	2	100	170	190	190	210	28
	East Branch	1	1	100	78	--	--	78	--
	Maspeth Creek	0	0	--	--	--	--	--	--
	Dutch Kills	2	2	100	41	68	68	94	38
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	3	3	100	39	39	53	82	25
	CM 1 – 2	3	3	100	66	160	780	2,100	1,200
	CM 2+	2	2	100	27	30	30	33	4.2

Notes:

Units are milligrams per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-40
Estimated Dissolved Phase Total PAH (17) in Mid-Depth Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	2	100	1.0	1,000	1,000	2,000	1,400
	East Branch	1	1	100	4.3	--	--	4.3	--
	Maspeth Creek	0	0	--	--	--	--	--	--
	Dutch Kills	2	2	100	0.17	3.3	3.3	6.4	4.4
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	3	3	100	0.18	3.0	4.6	11	5
	CM 1 – 2	3	3	100	0.43	1.8	10	29	16
	CM 2+	2	2	100	18	23	23	29	8

Notes:

Units are micrograms per liter.

Dissolved phase concentrations were estimated using site-specific partitioning coefficients with sample TSS.

Non-detects in summations set to 1/2 the MDL; if all individual compounds are non-detect, the summation is set to the maximum individual MDL.

All statistics are calculated using detect and non-detect samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

TSS = total suspended solids

Table 4-41
Estimated Dissolved Phase Total PCBs in Mid-Depth Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	2	100	15	200	200	400	270
	East Branch	1	1	100	110	--	--	110	--
	Maspeth Creek	0	0	--	--	--	--	--	--
	Dutch Kills	2	2	100	3.8	9.0	9.0	14	7.3
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	3	3	100	0.97	2.1	3.4	7.0	3.2
	CM 1 – 2	3	3	100	2.2	2.4	10	26	14
	CM 2+	2	2	100	1.3	1.8	1.8	2.2	0.67

Notes:

Units are nanograms per liter.

Dissolved phase concentrations were estimated using site-specific partitioning coefficients with sample TSS.

Non-detects in summations set to 1/2 the MDL; if all individual compounds are non-detect, the summation is set to the maximum individual MDL.

All statistics are calculated using detect and non-detect samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

PCB = polychlorinated biphenyl

TSS = total suspended solids

Table 4-42
Dissolved Copper in Mid-Depth Porewater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	2	0	0	2.0	--	--	2.0	--
	East Branch	1	1	100	4.5	--	--	4.5	--
	Maspeth Creek	0	0	--	--	--	--	--	--
	Dutch Kills	2	2	100	5.2	5.6	5.6	6.0	0.57
	Whale Creek	0	0	--	--	--	--	--	--
Main Stem	CM 0 – 1	3	1	33	2.0	--	--	45	--
	CM 1 – 2	3	2	67	2.0	2.7	16	44	24
	CM 2+	1	1	100	4.2	--	--	4.2	--

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-43
Salinity in Groundwater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	14	12	86	2.0	2.9	7.2	21	7.0
	East Branch	8	4	50	2.0	3.0	4.5	13	3.8
	Maspeth Creek	3	1	33	2.0	--	--	7.8	--
	Dutch Kills	7	7	100	3.2	15	13	19	5.2
	Whale Creek	3	3	100	17	18	18	19	1.0
Main Stem	CM 0 – 1	5	5	100	14	19	19	21	2.9
	CM 1 – 2	11	11	100	4.6	12	13	21	6.5
	CM 2+	13	10	77	2.0	3.5	4.4	9.2	2.5

Notes:

Units are practical salinity units (psu).

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-44
TSS in Groundwater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	14	14	100	15	56	88	370	96
	East Branch	8	8	100	35	98	200	820	270
	Maspeth Creek	3	3	100	69	270	410	890	430
	Dutch Kills	7	7	100	57	190	690	3,600	1,300
	Whale Creek	3	3	100	120	140	410	980	490
Main Stem	CM 0 – 1	5	5	100	57	84	150	440	160
	CM 1 – 2	11	11	100	18	170	650	2,600	880
	CM 2+	13	13	100	14	66	180	1,200	330

Notes:

Units are milligrams per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

MDL = method detection limit

TSS = total suspended solids

Table 4-45
Estimated Dissolved Phase Total PAH (17) in Groundwater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	14	14	100	0.11	1.9	130	1,300	360
	East Branch	8	8	100	0.23	1.6	2.4	5.6	2.2
	Maspeth Creek	3	3	100	0.57	2.6	4.0	8.8	4.3
	Dutch Kills	7	7	100	0.11	1.4	9.4	36	15
	Whale Creek	3	3	100	0.46	1.0	3.0	7.6	4.0
Main Stem	CM 0 – 1	5	5	100	0.52	30	340	1,500	640
	CM 1 – 2	11	11	100	0.13	1.3	3.2	9.9	3.5
	CM 2+	13	13	100	0.16	6.5	750	8,300	2,300

Notes:

Units are micrograms per liter.

Dissolved phase concentrations were estimated using site-specific partitioning coefficients with sample TSS.

Non-detects in summation set to 1/2 the MDL.

All statistics are calculated using detect and non-detect samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

CM = creek mile

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

TSS = total suspended solids

Table 4-46
Estimated Dissolved Phase Total PCBs in Groundwater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	14	14	100	3.2	18	49	170	62
	East Branch	8	8	100	2.0	9.8	18	69	22
	Maspeth Creek	3	3	100	0.071	0.37	6.9	20	12
	Dutch Kills	7	7	100	0.72	6.2	15	55	19
	Whale Creek	3	3	100	1.4	3.3	16	42	23
Main Stem	CM 0 – 1	5	5	100	1.1	3.5	5.5	13	4.9
	CM 1 – 2	11	11	100	0.11	1.3	3.2	11	4.0
	CM 2+	13	13	100	0.049	2.3	2.3	5.4	1.6

Notes:

Units are nanograms per liter.

Dissolved phase concentrations were estimated using site-specific partitioning coefficients with sample TSS.

Non-detects in summation set to 1/2 the MDL.

All statistics are calculated using detect and non-detect samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

CM = creek mile

MDL = method detection limit

PCB = polychlorinated biphenyl

TSS = total suspended solids

Table 4-47
Dissolved Copper in Groundwater – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	14	3	21	2.0	4.0	4.1	8.6	1.7
	East Branch	8	2	25	0.26	2.0	3.8	19	6.3
	Maspeth Creek	3	1	33	4.0	--	--	8.0	--
	Dutch Kills	7	5	71	4.0	4.2	5.5	9.1	2.0
	Whale Creek	3	0	0	2.0	--	--	4.0	--
Main Stem	CM 0 – 1	5	0	0	2.0	--	--	4.0	--
	CM 1 – 2	11	5	45	1.1	4.0	20	160	47
	CM 2+	13	3	23	0.90	4.0	3.8	7.8	1.6

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

MDL = method detection limit

Table 4-48
Fish and Crab Tissue Composite Summary

Category and Reach	Striped Bass		White Perch	Atlantic Menhaden	Mummichog	Blue Crab		Caged Bivalves	Polychaete
	Fillet	Whole-Body Composite Samples ¹	Fillet	Whole Body	Whole Body	Combined Muscle and Hepatopancreas ²	Whole-Body Composite Samples ³	Whole Body ⁴	Whole Body
Study Area									
Fish Sampling Zone 1	3	4	NC	4	4	3	4	3	2
Fish Sampling Zone 2	1	5	NC	4	4	1	4	1	1
Fish Sampling Zone 3	3	4	3	4	4	3	4	2	3
Fish Sampling Zone 4a	1	5	NC	4	4	1	4	2	3
Fish Sampling Zone 4b	1	5	3	4	4	1	4	0	1
Fish Sampling Zone 5	1	5	1	4	4	1	4	2	3
Reference Areas									
Gerritsen Creek	5	5	NC	5	5	5	5	0	0
Head of Bay	6	6	NC	5	5	5	5	0	0
Spring Creek	4	4	NC	5	5	5	5	0	0
Westchester Creek	5	5	5	5	5	5	5	0	0

Notes:

All tissue composites were created based on fish or crab size class. A minimum of five individuals were targeted for each composite. For the smaller blue crabs and mummichog, more than five individuals were needed to reach a target tissue weight for chemical analysis (see species-specific notes).

1 = Striped bass whole-body composites are a combination of whole-body fish and composites consisting of fillet and carcass, which were mathematically combined.

2 = Blue crab combined muscle and hepatopancreas composites are mathematically combined from the individual tissues.

3 = Blue crab whole-body composites are a combination of whole-body crabs and mathematically combined composites consisting of hepatopancreas, muscle, and carcass.

4 = Caged bivalve composites are whole-body tissue composites without the shell.

Acronyms:

cm = centimeter

NC = not captured

Table 4-49a
Total PAH (17) in Striped Bass Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	1	33	0.0054	--	--	0.020	--
	FSZ2	1	1	100	0.023	--	--	0.023	--
	FSZ3	3	2	67	0.015	0.058	0.044	0.059	0.025
	FSZ4a	1	1	100	0.037	--	--	0.037	--
	FSZ4b	1	1	100	0.032	--	--	0.032	--
	FSZ5	1	1	100	0.043	--	--	0.043	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	2	40	0.014	0.018	0.021	0.037	0.0091
Industrial/Non-CSO	Head of Bay	6	2	33	0.0030	0.016	0.013	0.019	0.0067
Non-Industrial/CSO	Spring Creek	4	3	75	0.0048	0.018	0.016	0.024	0.0083
Non-Industrial/Non-CSO	Gerritsen Creek	5	0	0	0.0018	--	--	0.015	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 4-49b
Total PAH (17) in Striped Bass Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	2	50	0.030	0.043	0.053	0.094	0.028
	FSZ2	5	5	100	0.053	0.066	0.070	0.097	0.016
	FSZ3	4	3	75	0.030	0.075	0.069	0.096	0.028
	FSZ4a	5	5	100	0.047	0.14	0.12	0.18	0.050
	FSZ4b	5	5	100	0.083	0.12	0.11	0.14	0.024
	FSZ5	5	5	100	0.046	0.12	0.10	0.13	0.036
Reference Areas									
Industrial/CSO	Westchester Creek	5	2	40	0.025	0.030	0.032	0.039	0.0061
Industrial/Non-CSO	Head of Bay	6	2	33	0.015	0.031	0.037	0.070	0.019
Non-Industrial/CSO	Spring Creek	4	3	75	0.017	0.031	0.028	0.034	0.0076
Non-Industrial/Non-CSO	Gerritsen Creek	5	3	60	0.00097	0.018	0.013	0.025	0.010

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49c
Total PAH (17) in White Perch Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	0	0	--	--	--	--	--	--
	FSZ2	0	0	--	--	--	--	--	--
	FSZ3	3	3	100	0.035	0.046	0.045	0.053	0.0089
	FSZ4a	0	0	--	--	--	--	--	--
	FSZ4b	3	3	100	0.023	0.025	0.029	0.039	0.0085
	FSZ5	1	1	100	0.027	--	--	0.027	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	3	60	0.019	0.025	0.025	0.031	0.0061
Industrial/Non-CSO	Head of Bay	0	0	--	--	--	--	--	--
Non-Industrial/CSO	Spring Creek	0	0	--	--	--	--	--	--
Non-Industrial/Non-CSO	Gerritsen Creek	0	0	--	--	--	--	--	--

Note:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49d
Total PAH (17) in Atlantic Menhaden – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.083	0.093	0.094	0.11	0.013
	FSZ2	4	4	100	0.073	0.092	0.094	0.12	0.023
	FSZ3	4	4	100	0.068	0.079	0.077	0.083	0.0067
	FSZ4a	4	4	100	0.10	0.16	0.16	0.20	0.049
	FSZ4b	4	4	100	0.066	0.15	0.14	0.18	0.050
	FSZ5	4	4	100	0.075	0.20	0.19	0.29	0.088
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.093	0.12	0.16	0.29	0.080
Industrial/Non-CSO	Head of Bay	5	5	100	0.025	0.026	0.029	0.044	0.0084
Non-Industrial/CSO	Spring Creek	5	5	100	0.021	0.032	0.029	0.038	0.0069
Non-Industrial/Non-CSO	Gerritsen Creek	5	3	60	0.0012	0.017	0.017	0.029	0.010

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49e
Total PAH (17) in Mummichog – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.084	0.15	0.14	0.19	0.044
	FSZ2	4	4	100	0.052	0.082	0.086	0.13	0.033
	FSZ3	4	4	100	0.0055	0.045	0.043	0.078	0.030
	FSZ4a	4	4	100	0.0095	0.030	0.026	0.033	0.011
	FSZ4b	4	4	100	0.030	0.076	0.088	0.17	0.067
	FSZ5	4	4	100	0.038	0.044	0.043	0.046	0.0033
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.044	0.077	0.13	0.29	0.11
Industrial/Non-CSO	Head of Bay	5	4	80	0.015	0.034	0.045	0.11	0.039
Non-Industrial/CSO	Spring Creek	5	5	100	0.021	0.030	0.039	0.079	0.024
Non-Industrial/Non-CSO	Gerritsen Creek	5	3	60	0.0024	0.016	0.016	0.024	0.0081

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49f
Total PAH (17) in Blue Crab Muscle and Hepatopancreas – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	2	67	0.10	0.11	0.11	0.13	0.015
	FSZ2	1	1	100	0.086	--	--	0.086	--
	FSZ3	3	3	100	0.051	0.068	0.072	0.098	0.024
	FSZ4a	1	1	100	0.079	--	--	0.079	--
	FSZ4b	1	0	0	0.070	--	--	0.070	--
	FSZ5	1	1	100	0.046	--	--	0.046	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	4	80	0.024	0.036	0.046	0.079	0.026
Industrial/Non-CSO	Head of Bay	5	5	100	0.0042	0.0076	0.0068	0.0079	0.0015
Non-Industrial/CSO	Spring Creek	5	4	80	0.0079	0.012	0.015	0.030	0.0085
Non-Industrial/Non-CSO	Gerritsen Creek	5	4	80	0.0026	0.0029	0.0058	0.018	0.0066

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49g
Total PAH (17) in Blue Crab Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	3	75	0.016	0.029	0.029	0.044	0.012
	FSZ2	4	4	100	0.0048	0.029	0.032	0.066	0.025
	FSZ3	4	4	100	0.034	0.041	0.050	0.085	0.023
	FSZ4a	4	4	100	0.025	0.039	0.038	0.051	0.011
	FSZ4b	4	4	100	0.027	0.036	0.040	0.061	0.015
	FSZ5	4	4	100	0.032	0.036	0.043	0.068	0.017
Reference Areas									
Industrial/CSO	Westchester Creek	5	4	80	0.0012	0.027	0.024	0.049	0.018
Industrial/Non-CSO	Head of Bay	5	5	100	0.0081	0.0089	0.0088	0.0099	0.00070
Non-Industrial/CSO	Spring Creek	5	3	60	0.0098	0.011	0.015	0.022	0.0060
Non-Industrial/Non-CSO	Gerritsen Creek	5	3	60	0.0021	0.0061	0.0087	0.016	0.0069

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PAH = polycyclic aromatic hydrocarbon

Table 4-49h
Total PAH (17) in Caged Bivalves – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	1	1	100	0.75	--	--	0.75	--
	East Branch	1	1	100	0.12	--	--	0.12	--
	Maspeth Creek	1	1	100	0.36	--	--	0.36	--
	Dutch Kills	1	1	100	0.23	--	--	0.23	--
	Whale Creek	1	1	100	0.18	--	--	0.18	--
Main Stem	CM 0 – 1	3	3	100	0.085	0.22	0.18	0.24	0.084
	CM 1 – 2	1	1	100	0.18	--	--	0.18	--
	CM 2+	1	1	100	0.21	--	--	0.21	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

PAH = polycyclic aromatic hydrocarbon

Table 4-49i
Total PAH (17) in Polychaete – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	10	10	100	0.21	0.34	0.34	0.44	0.070
	East Branch	5	5	100	0.039	0.057	0.060	0.091	0.019
	Maspeth Creek	5	5	100	0.049	0.075	0.072	0.094	0.019
	Dutch Kills	5	5	100	0.085	0.10	0.11	0.15	0.024
	Whale Creek	5	5	100	0.092	0.12	0.11	0.12	0.013
Main Stem	CM 0 – 1	10	10	100	0.037	0.067	0.071	0.13	0.030
	CM 1 – 2	10	10	100	0.026	0.061	0.060	0.090	0.017
	CM 2+	15	15	100	0.14	0.24	0.27	0.43	0.091

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronym:

CM = creek mile

PAH = polycyclic aromatic hydrocarbon

Table 4-50a
Total PCBs in Striped Bass Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	3	100	0.24	0.37	0.35	0.44	0.10
	FSZ2	1	1	100	0.24	--	--	0.24	--
	FSZ3	3	3	100	0.17	0.30	0.35	0.60	0.22
	FSZ4a	1	1	100	0.16	--	--	0.16	--
	FSZ4b	1	1	100	0.46	--	--	0.46	--
	FSZ5	1	1	100	1.1	--	--	1.1	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.056	0.084	0.096	0.15	0.039
Industrial/Non-CSO	Head of Bay	6	6	100	0.083	0.099	0.12	0.23	0.056
Non-Industrial/CSO	Spring Creek	4	4	100	0.091	0.13	0.13	0.15	0.028
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.029	0.091	0.14	0.28	0.12

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50b
Total PCBs in Striped Bass Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.67	1.0	1.2	2.1	0.60
	FSZ2	5	5	100	0.65	1.4	1.6	2.7	0.88
	FSZ3	4	4	100	0.97	1.7	1.9	3.2	0.95
	FSZ4a	5	5	100	1.3	1.4	1.8	2.9	0.68
	FSZ4b	5	5	100	1.7	2.1	2.1	2.6	0.34
	FSZ5	5	5	100	1.9	2.4	2.5	3.9	0.81
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.56	0.70	0.69	0.77	0.081
Industrial/Non-CSO	Head of Bay	6	6	100	0.34	0.42	0.48	0.84	0.18
Non-Industrial/CSO	Spring Creek	4	4	100	0.20	0.26	0.29	0.45	0.11
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.17	0.22	0.43	0.93	0.34

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50c
Total PCBs in White Perch Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	0	0	--	--	--	--	--	--
	FSZ2	0	0	--	--	--	--	--	--
	FSZ3	3	3	100	0.31	0.35	0.40	0.55	0.13
	FSZ4a	0	0	--	--	--	--	--	--
	FSZ4b	3	3	100	0.095	0.20	0.26	0.49	0.20
	FSZ5	1	1	100	0.33	--	--	0.33	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.12	0.15	0.16	0.25	0.053
Industrial/Non-CSO	Head of Bay	0	0	--	--	--	--	--	--
Non-Industrial/CSO	Spring Creek	0	0	--	--	--	--	--	--
Non-Industrial/Non-CSO	Gerritsen Creek	0	0	--	--	--	--	--	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50d
Total PCBs in Atlantic Menhaden – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.37	0.40	0.41	0.45	0.039
	FSZ2	4	4	100	0.47	0.52	0.52	0.57	0.048
	FSZ3	4	4	100	0.53	0.79	1.3	3.2	1.3
	FSZ4a	4	4	100	0.64	0.80	0.82	1.1	0.20
	FSZ4b	4	4	100	0.19	0.51	0.48	0.70	0.26
	FSZ5	4	4	100	0.48	1.1	0.97	1.2	0.34
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.23	0.30	0.33	0.52	0.11
Industrial/Non-CSO	Head of Bay	5	5	100	0.20	0.25	0.28	0.36	0.073
Non-Industrial/CSO	Spring Creek	5	5	100	0.17	0.22	0.22	0.27	0.045
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.13	0.16	0.17	0.22	0.033

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50e
Total PCBs in Mummichog – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.46	0.53	0.55	0.69	0.097
	FSZ2	4	4	100	0.66	5.4	6.8	16	7.4
	FSZ3	4	4	100	0.24	0.40	0.39	0.51	0.13
	FSZ4a	4	4	100	1.1	1.3	1.3	1.6	0.22
	FSZ4b	4	4	100	0.16	0.30	0.28	0.36	0.086
	FSZ5	4	4	100	0.72	0.96	0.91	1.0	0.13
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.17	0.22	0.22	0.26	0.038
Industrial/Non-CSO	Head of Bay	5	5	100	0.032	0.088	0.076	0.12	0.035
Non-Industrial/CSO	Spring Creek	5	5	100	0.081	0.091	0.090	0.11	0.011
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.094	0.13	0.14	0.20	0.042

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50f
Total PCBs in Blue Crab Muscle and Hepatopancreas – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	3	100	0.53	0.61	0.61	0.69	0.080
	FSZ2	1	1	100	0.55	--	--	0.55	--
	FSZ3	3	3	100	0.45	0.48	0.50	0.57	0.062
	FSZ4a	1	1	100	0.55	--	--	0.55	--
	FSZ4b	1	1	100	0.67	--	--	0.67	--
	FSZ5	1	1	100	0.66	--	--	0.66	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.25	0.38	0.35	0.41	0.066
Industrial/Non-CSO	Head of Bay	5	5	100	0.041	0.043	0.045	0.051	0.0039
Non-Industrial/CSO	Spring Creek	5	5	100	0.063	0.089	0.088	0.11	0.016
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.062	0.074	0.075	0.088	0.012

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50g
Total PCBs in Blue Crab Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.080	0.12	0.12	0.17	0.036
	FSZ2	4	4	100	0.15	0.24	0.26	0.42	0.13
	FSZ3	4	4	100	0.13	0.15	0.17	0.23	0.041
	FSZ4a	4	4	100	0.21	0.26	0.26	0.29	0.038
	FSZ4b	4	4	100	0.16	0.18	0.18	0.21	0.020
	FSZ5	4	4	100	0.14	0.22	0.22	0.29	0.069
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.050	0.093	0.091	0.15	0.039
Industrial/Non-CSO	Head of Bay	5	5	100	0.017	0.019	0.019	0.021	0.0017
Non-Industrial/CSO	Spring Creek	5	5	100	0.022	0.031	0.029	0.035	0.0050
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.027	0.029	0.029	0.033	0.0023

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

PCB = polychlorinated biphenyl

Table 4-50h
Total PCBs in Caged Bivalves – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	1	1	100	0.22	--	--	0.22	--
	East Branch	1	1	100	0.039	--	--	0.039	--
	Maspeth Creek	1	1	100	0.099	--	--	0.099	--
	Dutch Kills	1	1	100	0.059	--	--	0.059	--
	Whale Creek	1	1	100	0.022	--	--	0.022	--
Main Stem	CM 0 – 1	3	3	100	0.011	0.037	0.030	0.040	0.016
	CM 1 – 2	1	1	100	0.029	--	--	0.029	--
	CM 2+	1	1	100	0.10	--	--	0.10	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CM = creek mile

NA = not available

PCB = polychlorinated biphenyl

Table 4-50i
Total PCBs in Polychaete – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	10	10	100	0.30	0.70	0.72	1.2	0.40
	East Branch	5	5	100	0.020	0.023	0.023	0.027	0.0023
	Maspeth Creek	5	5	100	0.020	0.024	0.025	0.032	0.0048
	Dutch Kills	5	5	100	0.12	0.13	0.13	0.14	0.012
	Whale Creek	5	5	100	0.045	0.053	0.052	0.057	0.0054
Main Stem	CM 0 – 1	10	10	100	0.022	0.033	0.032	0.038	0.0041
	CM 1 – 2	10	10	100	0.024	0.044	0.041	0.057	0.012
	CM 2+	15	15	100	0.10	0.16	0.16	0.28	0.050

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronym:

CM = creek mile

PCB = polychlorinated biphenyl

Table 4-51a
Copper in Striped Bass Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	3	100	0.45	0.47	0.47	0.49	0.019
	FSZ2	1	1	100	0.43	--	--	0.43	--
	FSZ3	3	3	100	0.42	0.46	0.45	0.48	0.030
	FSZ4a	1	1	100	0.44	--	--	0.44	--
	FSZ4b	1	1	100	0.46	--	--	0.46	--
	FSZ5	1	1	100	0.50	--	--	0.50	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.46	0.49	0.49	0.51	0.018
Industrial/Non-CSO	Head of Bay	6	6	100	0.35	0.42	0.41	0.45	0.036
Non-Industrial/CSO	Spring Creek	4	4	100	0.37	0.43	0.43	0.48	0.058
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.40	0.44	0.44	0.48	0.033

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51b
Copper in Striped Bass Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	0.61	0.78	0.81	1.1	0.20
	FSZ2	5	5	100	0.70	0.79	0.89	1.3	0.24
	FSZ3	4	4	100	0.74	0.95	1.1	1.6	0.37
	FSZ4a	5	5	100	0.70	0.82	0.99	1.5	0.33
	FSZ4b	5	5	100	0.72	1.1	1.1	1.5	0.33
	FSZ5	5	5	100	0.70	0.88	0.94	1.4	0.26
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.51	0.79	0.77	0.90	0.15
Industrial/Non-CSO	Head of Bay	6	6	100	0.53	0.67	0.69	0.95	0.15
Non-Industrial/CSO	Spring Creek	4	4	100	0.59	0.66	0.66	0.72	0.051
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	0.56	0.62	0.66	0.79	0.10

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51c
Copper in White Perch Fillet – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	0	0	--	--	--	--	--	--
	FSZ2	0	0	--	--	--	--	--	--
	FSZ3	3	3	100	0.83	1.1	1.0	1.3	0.21
	FSZ4a	0	0	--	--	--	--	--	--
	FSZ4b	3	3	100	0.82	0.87	1.1	1.6	0.44
	FSZ5	1	1	100	0.89	--	--	0.89	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	0.83	1.1	1.0	1.2	0.16
Industrial/Non-CSO	Head of Bay	0	0	--	--	--	--	--	--
Non-Industrial/CSO	Spring Creek	0	0	--	--	--	--	--	--
Non-Industrial/Non-CSO	Gerritsen Creek	0	0	--	--	--	--	--	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51d
Copper in Atlantic Menhaden – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	1.5	1.6	1.6	1.7	0.046
	FSZ2	4	4	100	1.5	1.6	1.7	2.0	0.24
	FSZ3	4	4	100	1.6	1.9	2.0	2.6	0.43
	FSZ4a	4	4	100	2.6	4.8	4.8	6.9	2.0
	FSZ4b	4	4	100	2.7	5.4	5.1	7.1	1.8
	FSZ5	4	4	100	2.3	3.6	3.3	3.9	0.68
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	2.3	3.1	3.2	3.8	0.58
Industrial/Non-CSO	Head of Bay	5	5	100	1.5	1.7	1.7	1.9	0.18
Non-Industrial/CSO	Spring Creek	5	5	100	2.0	2.2	2.2	2.4	0.15
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	1.6	2.0	2.0	2.5	0.36

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51e
Copper in Mummichog – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	2.4	2.8	3.0	3.7	0.55
	FSZ2	4	4	100	1.7	2.5	2.4	3.1	0.72
	FSZ3	4	4	100	2.8	3.2	3.3	3.8	0.39
	FSZ4a	4	4	100	2.9	3.1	3.1	3.5	0.24
	FSZ4b	4	4	100	2.7	3.0	3.0	3.1	0.18
	FSZ5	4	4	100	2.7	2.9	2.9	3.1	0.19
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	1.7	2.0	2.2	2.8	0.54
Industrial/Non-CSO	Head of Bay	5	5	100	1.8	2.9	3.2	4.5	1.0
Non-Industrial/CSO	Spring Creek	5	5	100	1.5	1.7	1.7	1.8	0.12
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	1.7	2.5	2.9	5.6	1.6

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51f
Copper in Blue Crab Muscle and Hepatopancreas – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	3	3	100	17	22	21	24	3.7
	FSZ2	1	1	100	22	--	--	22	--
	FSZ3	3	3	100	14	15	15	16	0.63
	FSZ4a	1	1	100	16	--	--	16	--
	FSZ4b	1	1	100	21	--	--	21	--
	FSZ5	1	1	100	18	--	--	18	--
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	13	21	20	27	5.5
Industrial/Non-CSO	Head of Bay	5	5	100	12	12	13	15	1.4
Non-Industrial/CSO	Spring Creek	5	5	100	13	14	14	17	1.5
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	9.1	14	14	19	4.0

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51g
Copper in Blue Crab Whole Body – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Fish Sampling Zone	FSZ1	4	4	100	11	16	17	25	5.9
	FSZ2	4	4	100	9.5	16	16	24	6.1
	FSZ3	4	4	100	15	18	17	19	2.0
	FSZ4a	4	4	100	15	19	19	22	2.9
	FSZ4b	4	4	100	15	20	20	25	4.0
	FSZ5	4	4	100	13	16	16	19	2.8
Reference Areas									
Industrial/CSO	Westchester Creek	5	5	100	12	16	16	19	3.1
Industrial/Non-CSO	Head of Bay	5	5	100	12	12	12	13	0.65
Non-Industrial/CSO	Spring Creek	5	5	100	12	13	13	14	1.1
Non-Industrial/Non-CSO	Gerritsen Creek	5	5	100	7.8	11	11	17	3.6

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

CSO = combined sewer overflow

FSZ = fish sampling zone

Table 4-51h
Copper in Caged Bivalves – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	1	1	100	2.2	--	--	2.2	--
	East Branch	1	1	100	1.5	--	--	1.5	--
	Maspeth Creek	1	1	100	1.9	--	--	1.9	--
	Dutch Kills	1	1	100	2.4	--	--	2.4	--
	Whale Creek	1	1	100	1.2	--	--	1.2	--
Main Stem	CM 0 – 1	3	3	100	1.1	1.2	1.3	1.6	0.27
	CM 1 – 2	1	1	100	0.89	--	--	0.89	--
	CM 2+	1	1	100	1.6	--	--	1.6	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronyms:

-- = indicates no information that is appropriate or available

CM = creek mile

Table 4-51i
Copper in Polychaete – Summary Statistics

Category	Reach	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Study Area									
Tributaries	English Kills	10	10	100	1.4	1.5	1.6	2.5	0.33
	East Branch	5	5	100	1.1	1.2	1.2	1.3	0.056
	Maspeth Creek	5	5	100	1.2	1.2	1.2	1.3	0.049
	Dutch Kills	5	5	100	1.1	1.3	1.2	1.3	0.090
	Whale Creek	5	5	100	1.2	1.4	1.3	1.4	0.063
Main Stem	CM 0 – 1	10	10	100	0.97	1.2	1.2	1.5	0.17
	CM 1 – 2	10	10	100	1.1	1.3	1.4	2.1	0.32
	CM 2+	15	15	100	1.4	1.7	2.0	3.9	0.65

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier, if applicable.

Acronym:

CM = creek mile

Table 4-52
Phase 1 Ambient Air Data Evaluation Summary

Chemicals (with Detects)	Study Area Arithmetic Average (\pm SD) ¹	Percent Detects	Site-Specific Background Arithmetic Average (\pm SD) ¹	Percent Detects	NYSDEC Regional Background 95th Percentile Value
1,2-Dichlorotetrafluoroethane	0.080 \pm 0.0041	100	0.078 \pm 0.0031	100	0.15
1,3-Butadiene	0.035 \pm 0.0094	100	0.085 \pm 0.035	100	0.25
1,4-Dichlorobenzene	0.062 \pm 0.0082	96	0.068 \pm 0.010	100	1.9
Carbon Tetrachloride (Tetrachloromethane)	0.49 \pm 0.015	100	0.49 \pm 0.021	100	0.71
Dichlorodifluoromethane	1.4 \pm 0.21	100	1.3 \pm 0.24	100	3.8
1,1,1-Trichloroethane	0.050 \pm 0.029	33	0.039 \pm 0.0027	60	0.15
1,1,2-Trichlorotrifluoroethane	0.45 \pm 0.054	100	0.43 \pm 0.0090	100	0.96
1,2,4-Trimethylbenzene	0.29 \pm 0.21	100	0.44 \pm 0.16	100	1.3
1,2-Dichloroethane	0.052 \pm 0.0072	100	0.050 \pm 0.0044	100	0.10
1,2-Dichloroethene, cis-	0.028 \pm 0.011	8	0.026 U	0	0.030
1,3,5-Trimethylbenzene (Mesitylene)	0.088 \pm 0.055	100	0.13 \pm 0.042	100	0.49
Bromomethane (Methyl Bromide)	0.037 \pm 0.0052	100	0.035 \pm 0.0028	100	0.12
Chloroethane	0.029 \pm 0.028	79	0.023 \pm 0.0022	100	NA
Dichloromethane (Methylene Chloride)	2.7 \pm 1.5	100	3.1 \pm 1.3	100	2.0
Ethylbenzene	0.24 \pm 0.22	100	0.30 \pm 0.026	100	0.94
m,p-Xylene	0.68 \pm 0.36	100	1.0 \pm 0.13	100	2.7
o-Xylene	0.29 \pm 0.13	100	0.44 \pm 0.044	100	1.0
Styrene	0.082 \pm 0.054	96	0.10 \pm 0.054	100	0.24
Benzene	0.26 \pm 0.13	100	0.43 \pm 0.12	100	1.5
Chloroform	0.17 \pm 0.21	100	0.11 \pm 0.016	100	0.39
Chloromethane	0.99 \pm 0.68	100	0.89 \pm 0.47	100	1.6
Tetrachloroethene (PCE)	4.7 \pm 22	100	0.81 \pm 1.4	100	7.6
Trichloroethene (TCE)	0.11 \pm 0.33	38	0.055 \pm 0.038	40	0.36
Trichlorofluoromethane (Fluorotrichloromethane)	1.2 \pm 0.21	100	1.2 \pm 0.066	100	1.9
Toluene	1.9 \pm 1.9	100	3.7 \pm 1.7	100	5.9
Aroclor 1242	0.0032 \pm 0.0016	9	0.0028 U	0	NA

Notes:

Arithmetic average, standard deviation, and 95th percentile are rounded to two significant figures.

Units are micrograms per cubic meter.

1 = The arithmetic average and standard deviations are calculated with detected and non-detected results. Non-detected results are reported at the method detection limit (MDL).

Acronyms:

NA = not available

NYSDEC = New York State Department of Environmental Conservation

SD = standard deviation

U = not detected at reporting limit

Table 4-53
Phase 1 Ambient Air Evaluation Site-Specific Background Wilcoxon's Rank-Sum Test Summary

Analyte	W-statistic	p-Value	No. of On-Site Samples	No. of Background Samples	Geometric Mean Study Area ¹ (± SD)	Geometric Mean Background ¹ (± SD)
1,4-Dichlorobenzene	83	0.92	24	5	0.061 ± 0.0082	0.068 ± 0.010
1,1,2-Trichlorotrifluoroethane	37	0.088	24	5	0.45 ± 0.054	0.43 ± 0.0090
1,2,4-Trimethylbenzene	98	0.99	24	5	0.25 ± 0.21	0.41 ± 0.16
1,2-Dichloroethane	53	0.35	24	5	0.052 ± 0.0072	0.050 ± 0.0044
1,2-Dichlorotetrafluoroethane	49	0.23	24	5	0.080 ± 0.0041	0.078 ± 0.0031
1,3,5-Trimethylbenzene (Mesitylene)	100	0.99	24	5	0.078 ± 0.055	0.13 ± 0.042
1,3-Butadiene	110	1.0	24	5	0.034 ± 0.0094	0.079 ± 0.035
m,p-Xylene	100	0.99	24	5	0.62 ± 0.36	1.0 ± 0.13
Benzene	110	1.0	24	5	0.24 ± 0.13	0.42 ± 0.12
Bromomethane (Methyl Bromide)	50	0.25	24	5	0.037 ± 0.0052	0.035 ± 0.0028
Carbon tetrachloride (Tetrachloromethane)	69	0.70	24	5	0.49 ± 0.015	0.49 ± 0.021
Chloroethane	68	0.68	24	5	0.025 ± 0.028	0.023 ± 0.0022
Chloroform	71	0.75	24	5	0.13 ± 0.21	0.11 ± 0.016
Chloromethane	62	0.55	24	5	0.87 ± 0.68	0.81 ± 0.47
Dichlorodifluoromethane	42	0.16	24	5	1.4 ± 0.21	1.3 ± 0.24
Dichloromethane (Methylene chloride)	75	0.82	24	5	2.3 ± 1.5	2.9 ± 1.3
Ethylbenzene	100	1.0	24	5	0.20 ± 0.22	0.29 ± 0.026
Styrene	89	0.95	24	5	0.071 ± 0.054	0.096 ± 0.054
Tetrachloroethene (PCE)	47	0.23	24	5	0.35 ± 22	0.34 ± 1.4
Trichloroethene (TCE)	110	1.0	24	5	0.049 ± 0.33	0.048 ± 0.039
Toluene	53	0.33	24	5	1.6 ± 1.9	3.4 ± 1.7
Trichlorofluoromethane (Fluorotrichloromethane)	43	0.17	24	5	1.2 ± 0.21	1.2 ± 0.067
o-Xylene	110	1.0	24	5	0.27 ± 0.13	0.44 ± 0.044

Notes:

Statistics are rounded to two significant figures.

One-sided Wilcoxon Rank-sum test was conducted.

No compounds detected in the Study Area at concentrations significantly above site-specific background locations (P < 0.05).

1 = Units are micrograms per cubic meter.

Acronym:

SD = standard deviation

Table 4-54
Phase 1 Ambient Air Upland/Downwind
Student's Paired T-Test Summary

Analyte	Group ¹	Paired T-statistic	p-Value	No. of Detected Sample Pairs
1,1,1-Trichloroethane	Volatile Organics	--	--	3
1,1,2,2-Tetrachloroethane	Volatile Organics	--	--	0
1,1,2-Trichloroethane	Volatile Organics	--	--	0
1,1,2-Trichlorotrifluoroethane	Volatile Organics	1.6	0.14	9
1,1-Dichloroethane	Volatile Organics	--	--	0
1,1-Dichloroethene	Volatile Organics	--	--	0
1,2,4-Trimethylbenzene	Volatile Organics	-0.57	0.59	9
1,2-Dichloroethane	Volatile Organics	1.6	0.14	9
1,2-Dichloroethene, cis-	Volatile Organics	--	--	0
1,2-Dichloroethene, trans-	Volatile Organics	--	--	0
1,2-Dichloropropane	Volatile Organics	--	--	0
1,2-Dichlorotetrafluoroethane	Volatile Organics	1.8	0.10	9
1,3,5-Trimethylbenzene (Mesitylene)	Volatile Organics	-0.79	0.45	9
1,3-Butadiene	Volatile Organics	2.1	0.069	9
1,3-Dichloropropene, cis-	Volatile Organics	--	--	0
1,3-Dichloropropene, trans-	Volatile Organics	--	--	0
Benzene	Volatile Organics	1.5	0.17	9
Benzyl chloride	Volatile Organics	--	--	0
Bromodichloromethane	Volatile Organics	--	--	0
Bromoform (Tribromomethane)	Volatile Organics	--	--	0
Bromomethane (Methyl Bromide)	Volatile Organics	0.36	0.73	9
Carbon tetrachloride (Tetrachloromethane)	Volatile Organics	1.9	0.094	9
Chlorobenzene	Volatile Organics	--	--	0
Chloroethane	Volatile Organics	-0.44	0.69	4
Chloroform	Volatile Organics	2.1	0.070	9
Chloromethane	Volatile Organics	-1.1	0.31	9
Dichlorodifluoromethane	Volatile Organics	1.5	0.18	9
Dichloromethane (Methylene Chloride)	Volatile Organics	0.82	0.44	9
Ethylbenzene	Volatile Organics	1.1	0.30	9
Ethylene dibromide (1,2-Dibromoethane)	Volatile Organics	--	--	0
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	Volatile Organics	--	--	0
m,p-Xylene	Volatile Organics	0.67	0.52	9
Methyl tert-butyl ether (MTBE)	Volatile Organics	--	--	0
o-Xylene	Volatile Organics	0.62	0.55	9
Styrene	Volatile Organics	0.056	0.96	9
Tetrachloroethene (PCE)	Volatile Organics	1.0	0.34	9

Table 4-54
Phase 1 Ambient Air Upland/Downwind
Student's Paired T-Test Summary

Analyte	Group ¹	Paired T-statistic	p-Value	No. of Detected Sample Pairs
Toluene	Volatile Organics	1.3	0.22	9
Trichloroethene (TCE)	Volatile Organics	0.99	0.42	3
Trichlorofluoromethane (Fluorotrichloromethane)	Volatile Organics	-0.57	0.59	9
Vinyl chloride	Volatile Organics	--	--	0
1,2,4-Trichlorobenzene	Volatile Organics	--	--	0
1,2-Dichlorobenzene	Volatile Organics	--	--	0
1,3-Dichlorobenzene	Volatile Organics	--	--	0
1,4-Dichlorobenzene	Volatile Organics	-0.61	0.56	8
Aroclor 1016	PCB Aroclors	--	--	0
Aroclor 1221	PCB Aroclors	--	--	0
Aroclor 1232	PCB Aroclors	--	--	0
Aroclor 1242	PCB Aroclors	--	--	0
Aroclor 1248	PCB Aroclors	--	--	0
Aroclor 1254	PCB Aroclors	--	--	0
Aroclor 1260	PCB Aroclors	--	--	0
Aroclor 1262	PCB Aroclors	--	--	0
Aroclor 1268	PCB Aroclors	--	--	0

Notes:

1 = Units are micrograms per cubic meter.

Statistics are rounded to two significant figures.

No statistically significant differences in chemical concentrations between upwind and downwind stations ($P < 0.05$).

-- = Statistical test not conducted due to insufficient number (less than four) of detected pairs.

Acronym:

PCB = polychlorinated biphenyl

Table 5-1
Summary of Point Source Samples

Category	Type of Discharge		Station ID	Outfall ID	Location/DAR Site Name	No. of Samples	Total No. of Samples
Category 1: Individually Permitted Stormwater and Wastewater Discharges	Stormwater		MBT001	NCB-006131-001	Motiva Brooklyn Terminal (DAR No. 50)	3	11
			BPBT001	NCB-0004596-001	BP Products N America Brooklyn Terminal (DAR No. 48)	3	
			QGD002	NY0200841-002	Queens District 5/5a Garage (DAR No. 45)	2	
			EM001B	NY0267724-001	ExxonMobil Greenpoint Remediation Project (DAR No. 53)	3	
	Groundwater effluent from remediation and dewatering systems		CE11SC	NCB-0201138	Con Edison - 11th Street Conduit (DAR No. 110)	3	9
			EM001A	NY0267724-001	ExxonMobil Greenpoint Remediation Project (DAR No. 53)	3	
			EM002	NY0267724-002	ExxonMobil Greenpoint Remediation Project (DAR No. 53)	3	
	Category 1 Total:		7 stations				20 samples
Category 2: CSO and WWTP Discharges	2A: Combined Sewer Overflows		BB026	BB-026	Long Island City Interceptor System	4	20
			BB009	BB-009	Long Island City Interceptor System	3	
			NCB083	NCB-083	Morgan Avenue Interceptor System	3	
			NCB015	NCB-015	Morgan Avenue Interceptor System	3	
			NCQ077	NCQ-077	Morgan Avenue (via secondary interceptor)	3	
			NCQ029	NCQ-029	Morgan Avenue (via secondary interceptor)	3	
			NCB022	NCB-022	West Street Interceptor System	1	
	2B: WWTP Effluent Overflow		NCB002	NCB-002	Located at WWTP	3	3
Category 2 Total:		8 stations				23 samples	
Category 3: Other Stormwater Discharges	Category 3A: MS4 and Major Stormwater Discharges	MS4	NCB631	NCB-361	North Henry Street and Whale Creek	3	14
			NCQ632B	NCQ-632B	East Branch, near Grand Street Bridge, Queens side	3	
			NCQ637	NCQ-637	Near Calvary Cemetery	3	
			NCB629	NCB-629	Near terminus of English Kills	3	
			NCQ632*	NCQ-632	East Branch, near Grand Street Bridge, Queens side	1	
			NCQ633*	NCQ-633	Newtown Creek, Queens side, near confluence with English Kills	1	
	Discharge from multiple sites	BB610	BB-610	Terminus of Dutch Kills	3	9	
		MA001	NA	Meeker Avenue - Overland Flow	3		
		O185	O-185	Between Greenpoint Avenue and Apollo Street, Brooklyn side	3		
	Category 3B: Highway Drains		LIE001	Bridge downspout	Runoff from Long Island Expressway	3	3
	Category 3C: Direct Discharges from Individual Sites		HN001	HN-002 ¹	Hugo Neu Schnitzer (aka SIMS Hugo Neu; DAR No. 125)	3	9
			MCL001	NCQ-442	Maspeth Concrete Loading Corp. - Metropolitan Avenue (DAR No. 210)	3	
			RAD001	O-193	Review Avenue Development (RAD I; DAR No. 41)	3	
			WM001	O-202	Waste Management of NY/Steel Equities (formerly POW; DAR No. 56)/ Town, County and State Recycling, Inc. (aka Review Avenue Recycling, Inc.; DAR No. 145)	3	12
			NG001	NG-001	Greenpoint Energy Center (DAR No. 32)	3	
			FLH001	O-135	Former Laurel Hill Site (DAR No. 16)	3	
			MP001	NCB-0005789-001	Malu Properties/Former Ditmas Oil/ Former Gulf Oil (DAR No. 123)	3	
Category 3 Total:		17 stations				47 samples	
Newtown Creek WWTP Influent			1 station			6 samples	
Grand Total (all point sources):			33 stations			96 samples	

Summary by Discharge Type

Discharge Type	No. of Stations	No. of Samples
CSOs	7	20
Stormwater	21	58
Groundwater Effluent	3	9
WWTP Effluent Overflow	1	3
WWTP Influent	1	6
Total	33	96

Table 5-1
Summary of Point Source Samples

Notes:
1 = Discharge to Newtown Creek via overland flow
* = Only a small portion of the basin that drains to NCQ-633 could be sampled; this sampling location was removed from the sampling program by the USEPA following the first round of sampling.

Acronyms:
DAR = Data Applicability Report
CSO = combined sewer overflow
MS4 = municipal separate storm sewer system
N/A = not applicable
WWTP = wastewater treatment plant
USEPA = U.S. Environmental Protection Agency

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Table 5-2
TSS Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	27	82	96	220	59
WWTP Effluent Overflow – Category 2B	3	3	100	13	15	21	35	12
Individually Permitted Stormwater – Category 1	11	4	36	5.0	5.0	29	210	61
Stormwater – Categories 3A, 3B, and 3C	47	46	98	5.0	66	140	760	170
All Stormwater – Categories 1, 3A, 3B, and 3C	58	50	86	5.0	46	120	760	160
Groundwater Effluent – Category 1	9	4	44	5.0	5.0	8.4	19	5.2
WWTP Influent – Wet Weather	3	3	100	100	130	120	140	21
WWTP Influent – Dry Weather	3	3	100	100	120	120	150	25

Notes:

Units are milligrams per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

MDL = method detection limit

TSS = total suspended solids

WWTP = wastewater treatment plant

Table 5-3
Particulate Phase Fraction Organic Carbon in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	5.7	14	16	46	10
WWTP Effluent Overflow – Category 2B	3	3	100	36	36	41	52	9.5
Individually Permitted Stormwater – Category 1	11	3	27	10	20	22	39	7.8
Stormwater – Categories 3A, 3B, and 3C	47	46	98	1.5	13	14	39	8.9
All Stormwater – Categories 1, 3A, 3B, and 3C	58	49	84	1.5	14	16	39	9.1
Groundwater Effluent – Category 1	9	3	33	6.6	20	16	20	5.3
WWTP Influent – Wet Weather	3	3	100	5.0	6.7	16	35	17
WWTP Influent – Dry Weather	3	3	100	38	49	51	65	14

Notes:

Units are percent.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

MDL = method detection limit

WWTP = wastewater treatment plant

Table 5-4
DOC Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	16	80	1.2	9.3	9.2	26	5.6
WWTP Effluent Overflow – Category 2B	3	2	67	3.0	9.1	7.5	10	4.0
Individually Permitted Stormwater – Category 1	11	8	73	2.8	4.9	12	42	13
Stormwater – Categories 3A, 3B, and 3C	47	42	89	0.59	9.3	20	140	28
All Stormwater – Categories 1, 3A, 3B, and 3C	58	50	86	0.59	8.0	19	140	26
Groundwater Effluent – Category 1	9	9	100	1.3	3.8	3.8	6.4	1.4
WWTP Influent – Wet Weather	3	3	100	8.2	11	9.9	11	1.5
WWTP Influent – Dry Weather	3	3	100	31	33	36	43	6.7

Notes:

Units are milligrams per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

DOC = dissolved organic carbon

MDL = method detection limit

WWTP = wastewater treatment plant

Table 5-5
Total PAH (17) Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	0.77	2.5	3.3	9.6	2.6
WWTP Effluent Overflow – Category 2B	3	3	100	0.25	0.28	0.34	0.48	0.12
Individually Permitted Stormwater – Category 1	11	11	100	0.041	0.63	1.3	6.0	1.8
Stormwater – Categories 3A, 3B, and 3C	47	47	100	0.41	3.0	6.0	66	10
All Stormwater – Categories 1, 3A, 3B, and 3C	58	58	100	0.041	2.3	5.1	66	9.6
Groundwater Effluent – Category 1	9	9	100	0.0055	0.20	240	1,600	530
WWTP Influent – Wet Weather	3	3	100	2.4	3.3	3.1	3.7	0.66
WWTP Influent – Dry Weather	3	3	100	1.1	2.5	2.1	2.7	0.84

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier.

Acronyms:

PAH = polycyclic aromatic hydrocarbon

MDL = method detection limit

WWTP = wastewater treatment plant

Table 5-6
Total PAH (17) Particulate Phase Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	9.0	27	31	90	19
WWTP Effluent Overflow – Category 2B	3	3	100	4.8	5.2	5.9	7.7	1.6
Individually Permitted Stormwater – Category 1	4	4	100	17	23	41	100	40
Stormwater – Categories 3A, 3B, and 3C	46	46	100	2.1	36	40	140	29
All Stormwater – Categories 1, 3A, 3B, and 3C	50	50	100	2.1	35	40	140	29
Groundwater Effluent – Category 1	4	4	100	51	4,600	12,000	37,000	17,000
WWTP Influent – Wet Weather	3	3	100	15	19	22	32	9.3
WWTP Influent – Dry Weather	3	3	100	6.3	11	9.8	12	3.1

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit.

Particulate phase concentrations are measured or estimated from whole water samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using ½ detection limit for non-detect results.

Acronyms:

PAH = polycyclic aromatic hydrocarbon

WWTP = wastewater treatment plant

Table 5-7
Total PCB Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	4.3	27	45	190	54
WWTP Effluent Overflow – Category 2B	3	3	100	8.4	14	18	32	12
Individually Permitted Stormwater – Category 1	11	9	82	0.38	3.4	7.2	38	11
Stormwater – Categories 3A, 3B, and 3C	46	46	100	2.3	34	150	1,200	250
All Stormwater – Categories 1, 3A, 3B, and 3C	57	55	96	0.38	21	120	1,200	230
Groundwater Effluent – Category 1	9	4	44	0.14	0.41	0.74	3.3	0.97
WWTP Influent – Wet Weather	3	3	100	110	130	120	130	13
WWTP Influent – Dry Weather	3	3	100	10	35	30	44	18

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier.

Acronyms:

PCB = polychlorinated biphenyl

MDL = method detection limit

WWTP = wastewater treatment plant

Table 5-8
Total PCB Particulate Phase Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	0.099	0.24	0.38	1.1	0.29
WWTP Effluent Overflow – Category 2B	3	3	100	0.38	0.39	0.83	1.7	0.78
Individually Permitted Stormwater – Category 1	4	3	75	0.086	0.19	0.23	0.47	0.16
Stormwater – Categories 3A, 3B, and 3C	46	46	100	0.018	0.66	1.5	22	3.5
All Stormwater – Categories 1, 3A, 3B, and 3C	50	49	98	0.018	0.58	1.4	22	3.3
Groundwater Effluent – Category 1	4	4	100	0.011	0.039	0.059	0.15	0.061
WWTP Influent – Wet Weather	3	3	100	0.80	0.87	0.98	1.3	0.25
WWTP Influent – Dry Weather	3	3	100	0.070	0.21	0.22	0.39	0.16

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit.

Particulate phase concentrations are measured or estimated from whole water samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using ½ detection limit for non-detect results.

Acronyms:

PCB = polychlorinated biphenyl

WWTP = wastewater treatment plant

Table 5-9
Copper Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	6.9	28	38	120	26
WWTP Effluent Overflow – Category 2B	3	3	100	10	10	12	16	3.1
Individually Permitted Stormwater – Category 1	11	11	100	0.80	5.7	16	64	23
Stormwater – Categories 3A, 3B, and 3C	47	47	100	4.9	44	60	240	58
All Stormwater – Categories 1, 3A, 3B, and 3C	58	58	100	0.80	40	52	240	56
Groundwater Effluent – Category 1	9	4	44	0.30	1.8	2.0	4.0	1.6
WWTP Influent – Wet Weather	3	3	100	39	43	46	56	9.0
WWTP Influent – Dry Weather	3	3	100	45	49	55	72	14

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Acronyms:

MDL = method detection limit

WWTP = wastewater treatment plant

Table 5-10
Copper Particulate Phase Concentrations in Point Sources – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Arithmetic Average	Maximum	Standard Deviation
Combined Sewer Overflows – Category 2A	20	20	100	8.7	280	270	530	130
WWTP Effluent Overflow – Category 2B	3	3	100	120	190	190	250	63
Individually Permitted Stormwater – Category 1	4	4	100	240	430	420	560	130
Stormwater – Categories 3A, 3B, and 3C	45	45	100	53	360	490	2,200	440
All Stormwater – Categories 1, 3A, 3B, and 3C	49	49	100	53	380	490	2,200	430
Groundwater Effluent – Category 1	2	2	100	24	29	29	35	7.5
WWTP Influent – Wet Weather	3	3	100	290	300	300	310	12
WWTP Influent – Dry Weather	3	3	100	200	290	290	390	92

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit.

Particulate phase concentrations are calculated from whole water samples.

Statistics show two significant figures, except where data were reported as one significant figure.

Results where dissolved fraction is greater than total fraction not included.

Acronym:

WWTP = wastewater treatment plant

Table 5-11
Estimated TSS Point Source Loads

Category	Reach	Type	Annual Flow Rate	Estimated Mean Load	Lower Bound Load	Upper Bound Load
Tributaries	English Kills	Combined Sewer Overflows	380	140	99	180
		Stormwater	200	100	61	170
		Reach Total	590	240	160	350
	East Branch	Combined Sewer Overflows	580	210	150	270
		Stormwater	150	73	44	120
		Reach Total	730	280	190	390
	Maspeth Creek	Combined Sewer Overflows	640	230	160	300
		Stormwater	61	31	18	51
		Reach Total	700	260	180	350
	Dutch Kills	Combined Sewer Overflows	180	67	48	86
		Stormwater	21	10	6.3	18
		Reach Total	210	77	54	100
	Whale Creek	WWTP Effluent Overflow	730	58	36	96
		Stormwater	4.0	2.0	1.2	3.3
		Reach Total	730	60	37	100
Main Stem	CM 0 – 1	Combined Sewer Overflows	45	16	12	21
		Stormwater	65	33	20	55
		Groundwater Effluent	31	1.7	1.0	2.2
		Reach Total	140	50	32	78
	CM 1 – 2	Combined Sewer Overflows	2.2	0.81	0.57	1.0
		Stormwater	210	110	63	180
		Groundwater Effluent	340	7.0	6.4	8.2
		Reach Total	550	110	70	190
	CM 2+	Combined Sewer Overflows	28	10	7.1	13
		Stormwater	270	140	81	230
		Reach Total	300	150	89	240
All		Combined Sewer Overflows	1,900	670	480	870
		WWTP Effluent Overflow	730	58	36	96
		Stormwater	990	490	290	820
		Groundwater Effluent	370	8.7	7.4	10
		Total	4,000	1,200	820	1,800

Notes:

Flow rate units are million gallons per year, and load units are metric tons per year. Flow rates and loads show two significant figures. Total values may not add up exactly due to component values used in the summation being rounded to two significant figures. Upper and lower bounds calculated from 95% confidence limits and/or minimum and maximum concentrations. Bold italics indicate totals.

Acronyms:

CM = creek mile

TSS = total suspended solids

WWTP = wastewater treatment plant

Table 5-12
Estimated Total PAH (17) Point Source Loads

Category	Reach	Type	Annual Flow Rate	Estimated Mean Load	Lower Bound Load	Upper Bound Load
Tributaries	English Kills	Combined Sewer Overflows	380	4.9	3.3	7.2
		Stormwater	200	4.2	2.6	6.8
		Reach Total	590	9.1	5.9	14
	East Branch	Combined Sewer Overflows	580	7.5	5.1	11
		Stormwater	150	3.0	1.9	4.9
		Reach Total	730	10	6.9	16
	Maspeth Creek	Combined Sewer Overflows	640	8.2	5.6	12
		Stormwater	61	1.3	0.78	2.0
		Reach Total	700	9.5	6.3	14
	Dutch Kills	Combined Sewer Overflows	180	2.4	1.6	3.5
		Stormwater	21	0.43	0.27	0.70
		Reach Total	210	2.8	1.9	4.2
	Whale Creek	WWTP Effluent Overflow	730	0.93	0.69	1.3
		Stormwater	4.0	0.082	0.050	0.13
		Reach Total	730	1.0	0.74	1.4
Main Stem	CM 0 – 1	Combined Sewer Overflows	45	0.57	0.39	0.84
		Stormwater	65	1.3	0.83	2.2
		Groundwater Effluent	31	83	25	190
		Reach Total	140	85	26	190
	CM 1 – 2	Combined Sewer Overflows	2.2	0.029	0.019	0.042
		Stormwater	210	4.4	2.7	7.0
		Groundwater Effluent	340	0.75	0.062	2.0
		Reach Total	550	5.1	2.8	9.1
	CM 2+	Combined Sewer Overflows	28	0.35	0.24	0.52
		Stormwater	270	5.6	3.5	9.1
		Reach Total	300	6.0	3.7	9.6
All		Combined Sewer Overflows	1,900	24	16	35
		WWTP Effluent Overflow	730	0.93	0.69	1.3
		Stormwater	990	20	13	33
		Groundwater Effluent	370	83	25	190
		Total	4,000	130	54	260

Notes:

Flow rate units are million gallons per year, and load units are kilograms per year. Flow rates and loads show two significant figures. Total values may not add up exactly due to component values used in the summation being rounded to two significant figures. Upper and lower bounds calculated from 95% confidence limits and/or minimum and maximum concentrations. Concentrations used in load calculations were totaled using Kaplan-Meier. Bold italics indicate totals.

Acronyms:

CM = creek mile

PAH = polycyclic aromatic hydrocarbon

WWTP = wastewater treatment plant

Table 5-13
Estimated Total PCB Point Source Loads

Category	Reach	Type	Annual Flow Rate	Estimated Mean Load	Lower Bound Load	Upper Bound Load
Tributaries	English Kills	Combined Sewer Overflows	380	0.069	0.035	0.13
		Stormwater	200	0.13	0.055	0.29
		Reach Total	590	0.19	0.090	0.43
	East Branch	Combined Sewer Overflows	580	0.10	0.054	0.21
		Stormwater	150	0.089	0.039	0.21
		Reach Total	730	0.19	0.092	0.41
	Maspeth Creek	Combined Sewer Overflows	640	0.12	0.059	0.23
		Stormwater	61	0.038	0.016	0.087
		Reach Total	700	0.15	0.075	0.31
	Dutch Kills	Combined Sewer Overflows	180	0.033	0.017	0.065
		Stormwater	21	0.013	0.0056	0.030
		Reach Total	210	0.046	0.023	0.095
	Whale Creek	WWTP Effluent Overflow	730	0.050	0.023	0.087
		Stormwater	4	0.0024	0.0011	0.0056
		Reach Total	730	0.053	0.024	0.093
Main Stem	CM 0 – 1	Combined Sewer Overflows	45	0.0081	0.0041	0.016
		Stormwater	65	0.040	0.017	0.093
		Groundwater Effluent	31	0.00017	0.000030	0.00039
		Reach Total	140	0.048	0.022	0.11
	CM 1 – 2	Combined Sewer Overflows	2.2	0.00040	0.00020	0.00079
		Stormwater	210	0.13	0.056	0.30
		Groundwater Effluent	340	0.00050	0.00034	0.00069
		Reach Total	550	0.13	0.057	0.30
	CM 2+	Combined Sewer Overflows	28	0.0050	0.0025	0.010
		Stormwater	270	0.17	0.073	0.39
		Reach Total	300	0.17	0.075	0.40
All		Combined Sewer Overflows	1,900	0.34	0.17	0.66
		WWTP Effluent Overflow	730	0.050	0.023	0.087
		Stormwater	990	0.61	0.26	1.4
		Groundwater Effluent	370	0.00067	0.00037	0.0011
		Total	4,000	0.99	0.46	2.1

Notes:

Flow rate units are million gallons per year, and load units are kilograms per year. Flow rates and loads show two significant figures. Total values may not add up exactly due to component values used in the summation being rounded to two significant figures. Upper and lower bounds calculated from 95% confidence limits and/or minimum and maximum concentrations. Concentrations used in load calculations were totaled using Kaplan-Meier. Bold italics indicate totals.

Acronyms:

CM = creek mile
PCB = polychlorinated biphenyl
WWTP = wastewater treatment plant

Table 5-14
Estimated Copper Point Source Loads

Category	Reach	Type	Annual Flow Rate	Estimated Mean Load	Lower Bound Load	Upper Bound Load
Tributaries	English Kills	Combined Sewer Overflows	380	55	38	73
		Stormwater	200	49	31	78
		Reach Total	590	100	69	150
	East Branch	Combined Sewer Overflows	580	85	57	110
		Stormwater	150	35	22	55
		Reach Total	730	120	80	170
	Maspeth Creek	Combined Sewer Overflows	640	93	63	120
		Stormwater	61	15	9.3	23
		Reach Total	700	110	72	150
	Dutch Kills	Combined Sewer Overflows	180	27	18	35
		Stormwater	21	5.1	3.2	8.0
		Reach Total	210	32	21	43
	Whale Creek	WWTP Effluent Overflow	730	33	27	43
		Stormwater	4	0.96	0.61	1.5
		Reach Total	730	34	28	44
Main Stem	CM 0 – 1	Combined Sewer Overflows	45	6.5	4.4	8.6
		Stormwater	65	16	10	25
		Groundwater Effluent	31	0.22	0.057	0.47
		Reach Total	140	22	14	34
	CM 1 – 2	Combined Sewer Overflows	2.2	0.32	0.22	0.43
		Stormwater	210	51	32	80
		Groundwater Effluent	340	2.7	0.39	5.1
		Reach Total	550	54	33	86
	CM 2+	Combined Sewer Overflows	28	4.0	2.7	5.3
		Stormwater	270	66	42	100
		Reach Total	300	70	44	110
All		Combined Sewer Overflows	1,900	270	180	360
		WWTP Effluent Overflow	730	33	27	43
		Stormwater	990	240	150	380
		Groundwater Effluent	370	2.9	0.44	5.6
		Total	4,000	540	360	780

Notes:

Flow rate units are million gallons per year, and load units are kilograms per year. Flow rates and loads show two significant figures. Total values may not add up exactly due to component values used in the summation being rounded to two significant figures. Upper and lower bounds calculated from 95% confidence limits and/or minimum and maximum concentrations. Bold italics indicate totals.

Acronyms:

CM = creek mile

WWTP = wastewater treatment plant

Table 5-15
Groundwater Tier 3 Analysis Results

Groundwater Segment	Segment Interpolated Seepage (cubic feet per day)¹	Tier 3 Modified Seepage (cubic feet per day)^{2,3}	Tier 3 Multiplier⁴
1	-260,000	-260,000	1.0
2	6,300	6,600	1.0
3	570	280	0.5
4	1,800	1,800	1.0
5	3,000	3,000	1.0
6	7,000	5,800	0.8
7	1,700	2,900	1.7
8	9,400	9,300	1.0
9	560	620	1.1
10	-4,300	-7,600	1.8
11	-13,000	-9,900	0.7
12	-20,000	-20,000	1.0
13	4,400	4,400	1.0
14	6,300	6,300	1.0
15	440	440	1.0
16	65	65	1.0
17	3,400	3,400	1.0
18	54,000	54,000	1.0
19	13,000	13,000	1.0
20	1,100	1,100	1.0
21	780	780	1.0
22	950	950	1.0
23	2,000	2,000	1.0
24	3,400	3,400	1.0
25	1,400	1,400	1.0
26	1,500	1,500	1.0
27	5,400	5,500	1.0
28	3,800	3,800	1.0
29	920	460	0.5
30	780	390	0.5
31	25,000	26,000	1.0
32	6,500	6,500	1.0
33	15,000	15,000	1.0
34	5,500	5,500	1.0
35	13,000	13,000	1.0
36	11,000	11,000	1.0
37	9,400	8,200	0.9
38	23,000	24,000	1.1
39	220	220	1.0
40	1,400	1,400	1.0
41	2,000	2,000	1.0

Table 5-15
Groundwater Tier 3 Analysis Results

Groundwater Segment	Segment Interpolated Seepage (cubic feet per day)¹	Tier 3 Modified Seepage (cubic feet per day)^{2,3}	Tier 3 Multiplier⁴
42	7,200	7,200	1.0
43	81,000	81,000	1.0
44	8,600	8,600	1.0
45	-41,000	-41,000	1.0
46	7,500	7,500	1.0
47	4,300	4,300	1.0
48	5,300	5,500	1.0
49	2,500	2,300	1.0
50	760	1,500	2.0
51	4,400	2,200	0.5
52	6,800	7,300	1.1
53	-560	270	-0.5
54	-76,000	-89,000	1.2
55	-24,000	-12,000	0.5
56	-280,000	-280,000	1.0

Notes:

All values are rounded to two significant figures.

1 = Segment interpolated seepage for a segment is calculated by summing the interpolated seepage rates for the grid cells that correspond to that segment. Positive seepage values indicate that the net flow of groundwater is into the creek ("gaining stream"). Negative seepage values indicate that the net flow of groundwater is away from the creek ("losing stream").

2 = In Tier 3, groundwater discharge rates were adjusted to account for the different shoreline types along the boundaries of the Study Area.

3 = Deep barriers are assumed to reduce the discharge to (or from) a segment or sub-segment by 50%; shallow barriers are assumed to reduce the discharge to (or from) a segment or sub-segment by 5%.

4 = Tier 3 multiplier is the ratio of Tier 3 modified seepage over segment interpolated seepage.

Table 5-16
Estimated Groundwater Loads to Study Area

Category	Reach	Annual Flow Rate	Annual Chemical Loads		
			Estimated Dissolved Total PAH (17)	Estimated Dissolved Total PCBs	Dissolved Copper
Tributaries	English Kills	310	5.3	0.052	4.0
	East Branch	55	0.52	0.0022	0.65
	Maspeth Creek	15	0.19	0.00012	0.26
	Dutch Kills	32	0.76	0.00078	0.62
	Whale Creek	16	0.15	0.00052	0.21
Main Stem	CM 0 – 1	65	33	0.00062	0.96
	CM 1 – 2	82	0.72	0.00043	3.2
	CM 2+	480	1,600	0.0044	6.6
Total		1,100	1,700	0.061	16

Notes:

Flow rate units are million gallons per year, and load units are kilograms per year.

All values are rounded to two significant figures. Reported totals shown in italics may not equal the sum of reported individual values due to rounding.

Groundwater discharge and chemical loads correspond to areas of positive seepage and do not account for areas of negative seepage. Positive seepage values indicate that the net flow of groundwater is into the creek ("gaining stream"). Negative seepage values indicate that the net flow of groundwater is away from the creek ("losing stream").

Acronyms:

CM = creek mile

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

Table 5-17
Total PAH (17) in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	30	30	100	0.050	0.13	0.15	0.47	0.098
Transect, Flood Tide	48	48	100	0.066	0.15	0.19	1.0	0.15
Transect, Ebb Tide	9	9	100	0.084	0.15	0.14	0.21	0.042

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

Acronyms:

MDL = method detection limit

PAH = polycyclic aromatic hydrocarbon

Table 5-18
Estimated Particulate Phase Total PAH (17) in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	30	30	100	0.75	3.2	3.2	7.2	1.5
Transect, Flood Tide	48	48	100	0.83	3.6	4.0	11	2.5
Transect, Ebb Tide	9	9	100	2.3	3.2	3.6	5.6	1.2

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5, if applicable.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

Samples with non-detected total suspended solids not included.

Acronym:

PAH = polycyclic aromatic hydrocarbon

Table 5-19
Total PCBs in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	30	30	100	1.8	4.0	4.8	11	2.2
Transect, Flood Tide	48	45	94	0.24	5.3	5.7	21	3.5
Transect, Ebb Tide	9	9	100	2.0	6.5	5.8	11	3.1

Notes:

Units are nanograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using Kaplan-Meier.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

Acronyms:

MDL = method detection limit

PCB = polychlorinated biphenyl

Table 5-20
Estimated Particulate Phase Total PCBs in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	30	30	100	0.038	0.15	0.15	0.23	0.06
Transect, Flood Tide	48	45	94	0.012	0.18	0.18	0.96	0.15
Transect, Ebb Tide	9	9	100	0.10	0.15	0.19	0.43	0.10

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Totals reported using estimated detection limit times 0.5.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

Samples with non-detected total suspended solids not included.

Acronym:

PCB = polychlorinated biphenyl

Table 5-21
Copper in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	30	19	63	2.0	4.8	5.0	9.0	2.1
Transect, Flood Tide	48	31	65	2.0	5.1	5.1	9.8	2.3
Transect, Ebb Tide	9	4	44	2.0	4.0	4.6	8.2	2.4

Notes:

Units are micrograms per liter.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the MDL.

Statistics show two significant figures, except where data were reported as one significant figure.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

Acronym:

MDL = method detection limit

Table 5-22
Calculated Particulate Phase Copper in Surface Water from East River – Summary Statistics

Category	Count	Count Detect	Percent Detect	Minimum	Median	Average	Maximum	Standard Deviation
Study Area								
East River	13	13	100	24	76	110	330	100
Transect, Flood Tide	20	20	100	9.5	95	110	320	88
Transect, Ebb Tide	1	1	100	58	--	--	58	--

Notes:

Units are milligrams per kilogram.

All statistics are calculated using detect and non-detect samples. Non-detect samples are set to the calculated or estimated detection limit, where applicable.

Statistics show two significant figures, except where data were reported as one significant figure.

Samples with non-detected total suspended solids not included.

Results where dissolved fraction is greater than total fraction not included.

Flood/ebb tide refers to prevailing tide condition at the time of sampling; due to complex circulation patterns at the mouth, localized flow directions can differ at the individual transect sampling points.

-- = indicates no information that is appropriate or available

Table 5-23
Atmospheric Deposition Chemical Loads to Study Area

Chemical	Amospheric Deposition (NJADN) ¹							Annual Point Source Load ² (kg/yr)	Ratio of Annual Loads (Point Source/ Atmospheric Deposition)
	Annual Gas Absorption Flux (µg/m ² /yr)	Annual Dry Particle Deposition Flux (µg/m ² /yr)	Annual Precipitation/ Wet Deposition Flux (µg/m ² /yr)	Annual Total Atmospheric Deposition Flux (µg/m ² /yr)	Reach	Surface Area (acres)	Annual Atmospheric Deposition Load (kg/yr)		
Total PAH (36)	5,900	1,000	360	7,300	English Kills	24	0.71	9.1	13
					East Branch	10	0.30	10	33
					Maspeth Creek	6.7	0.20	9.5	48
					Dutch Kills	13	0.38	2.8	7.4
					Whale Creek	3.5	0.10	1.0	10
					CM 0 – 1	43	1.3	85	65
					CM 1 – 2	31	0.92	5.1	5.5
					CM 2+	39	1.2	6.0	5.0
					Study Area	170	5.0	130	26
Total PCBs	46	8.4	4.0	59	English Kills	24	0.0057	0.19	33
					East Branch	10	0.0024	0.19	79
					Maspeth Creek	6.7	0.0016	0.15	94
					Dutch Kills	13	0.0031	0.046	15
					Whale Creek	3.5	0.00084	0.053	63
					CM 0 – 1	43	0.010	0.048	4.8
					CM 1 – 2	31	0.0074	0.13	18
					CM 2+	39	0.0093	0.17	18
					Study Area	170	0.041	0.99	24
Copper	-- ³	1,500	2,200	3,700	English Kills	24	0.36	100	280
					East Branch	10	0.15	120	800
					Maspeth Creek	6.7	0.10	110	1100
					Dutch Kills	13	0.19	32	170
					Whale Creek	3.5	0.052	34	650
					CM 0 – 1	43	0.64	22	34
					CM 1 – 2	31	0.46	54	120
					CM 2+	39	0.58	70	120
					Study Area	170	2.5	540	220

Notes:

All values are rounded to two significant figures. Reported totals may not equal the sum of reported individual values due to rounding.

1 = The gas absorption, dry particle, and precipitation deposition fluxes are derived from The New Jersey Atmospheric Deposition Network Report, dated January 2004 (Kleinfelder et al. 2004).

2 = The annual point source loads derived from estimated point source load tables; the total PAH value is a sum of total PAH (17) components.

3 = Gas absorption is a process that is not observed in metals and not included for copper.

Acronyms:

µg = microgram

CM = creek mile

kg = kilogram

m² = square meter

NJADN = New Jersey Atmospheric Deposition Network

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

yr = year

Reference:

Reinfelder et al. (J.R. Reinfelder, L.A. Totten, and S.J. Eisenreich), 2004. *The New Jersey Atmospheric Deposition Network (NJADN)* . Prepared for New Jersey Department of Environmental Protection. Available from: <http://www.state.nj.us/dep/dsr/njadn/fullreport.pdf>. January 2004.

Table 6-1
Partition Coefficients (Log K_{OC} or Log K_d) from Literature

Chemical		Log K _{OC} (L/kg OC) (log K _d [L/kg dry weight] for Copper)	Literature Reference
Polychlorinated Biphenyl Homolog Groups ¹	Monochlorobiphenyls	4.9	Hawker and Connell (1988) de Bruijn (1989) DiToro (1985)
	Dichlorobiphenyls	5.4	
	Trichlorobiphenyls	5.8	
	Tetrachlorobiphenyls	6.3	
	Pentachlorobiphenyls	6.7	
	Hexachlorobiphenyls	7.1	
	Heptachlorobiphenyls	7.4	
	Octachlorobiphenyls	7.8	
	Nonachlorobiphenyls	8.1	
	Decachlorobiphenyls	8.4	
	2-Methylnaphthalene	3.8	USEPA (2003) DiToro (1985)
Polycyclic Aromatic Hydrocarbons	Acenaphthene	3.9	
	Acenaphthylene	3.2	
	Anthracene	4.5	
	Benzo(a)anthracene	5.6	
	Benzo(a)pyrene	6.0	
	Benzo(b)fluoranthene	6.2	
	Benzo(g,h,i)perylene	6.4	
	Benzo(j,k)fluoranthene	6.2	
	Chrysene	5.6	
	Dibenz(a,h)anthracene	6.6	
	Fluoranthene	5.0	
	Fluorene	4.1	
	Indeno(1,2,3-c,d)pyrene	6.6	
	Naphthalene	3.3	
	Phenanthrene	4.5	
	Pyrene	4.8	
Copper ²		4.1 (sediment/porewater)	Allison and Allison (2005)
		4.7 (suspended matter/water)	

Table 6-1
Partition Coefficients (Log K_{OC} or Log K_d) from Literature

Notes:

1 = Average log K_{OC} values developed by arithmetically averaging results from individual congeners within each homolog group. Log K_{OW} values for PCBs as cited by Hawker and Connell (1988) are widely used, though they were measured by a generator column. Log K_{OW} values measured by the “slow-stirring” method are considered more accurate. Therefore, the Hawker and Connell PCB log K_{OW} values were adjusted based on a correlation with log K_{OW} values measured by de Bruijn et al. (1989) using the “slow-stirring” method (de Bruijn's log K_{OW} values were not used directly because that study only measured 20 PCB congeners).

2 = Log K_d values for copper represent the median values from the cited study's literature survey.

References:

Allison and Allison (Allison, J.D., and T.L. Allison), 2005. *Partition Coefficients for Metals in Surface Water, Soil, and Waste*. U.S. Environmental Protection Agency. USEPA/600/R-05/074. July 2005.

de Bruijn et al. (de Bruijn, J., F. Busser, W. Seinen, and J. Hermens), 1989. Determination of Octanol/Water Partition Coefficients for Hydrophobic Organic Chemicals with the "Slow-Stirring" Method. *Environmental Toxicology and Chemistry* 8:499 – 512.

DiToro, D.M., 1985. A particle interaction model of reversible organic chemical sorption. *Chemosphere* 14(10):1503 – 1538.

Hawker and Connell (D.W. Hawker and D.W. Connell), 1988. Octanol-Water Partition Coefficients of Polychlorinated Biphenyl Congeners. *Environmental Science and Technology* 22:382 – 387.

USEPA (U.S. Environmental Protection Agency), 2003. *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures* (Table 3-4). Office of Research and Development. EPA/600/R-02/013. November 2003.

Acronyms:

K_d = equilibrium partitioning coefficient

K_{OC} = organic carbon partitioning coefficient

K_{OW} = octanol-water partitioning coefficient

L/kg = liters per kilogram

OC = organic carbon

PCB = polychlorinated biphenyl

Table 6-2
Partition Coefficients (Log K_{OC} or Log K_d) from Literature and Site-Specific Data

Chemical		Literature Log K _{OC} (L/kg OC) (log K _d [L/kg dry weight] for Copper) ¹	Average Log K _{OC} Derived from Study Area Data ²		
			Porewater	Point Source	Surface Water
Polychlorinated Biphenyl Homolog Groups	Dichlorobiphenyls	5.4	5.7	5.3	NA
	Trichlorobiphenyls	5.8	6.1	5.8	NA
	Tetrachlorobiphenyls	6.3	6.6	6.1	NA
	Pentachlorobiphenyls	6.7	7.0	6.3	NA
	Hexachlorobiphenyls	7.1	7.4	6.5	NA
	Heptachlorobiphenyls	7.4	7.9	6.5	NA
Polycyclic Aromatic Hydrocarbons	Benzo(a)pyrene	6.0	7.3	6.6	NA
	Fluoranthene	5.0	5.9	5.7	NA
	Naphthalene	3.3	4.8	4.6	NA
	Pyrene	4.8	5.8	5.7	NA
	C3-Naphthalenes	4.7 ³	4.9	4.7	NA
Copper ⁴		4.1 (sediment/porewater)	5.0	4.6	4.6
		4.7 (suspended matter/water)			

Notes:

1 = See Table 6-1 for literature references.

2 = Average Log K_{OC} values derived via analysis of the following site-specific datasets: surface sediment versus shallow porewater, point source particulate versus dissolved, and surface water particulate versus dissolved (for copper only).

3 = C3-naphthalenes are not presented in Table 6-1; literature reference for log K_{OC} is USEPA (2003).

4 = Log K_d values for copper represent the median values from the cited study's literature survey.

Acronyms:

K_d = equilibrium partitioning coefficient

K_{OC} = organic carbon partitioning coefficient

L/kg = liters per kilogram

NA = not available

OC = organic carbon

Table 6-3
Rain Events for Surface Water Sampling During Point Source Discharges

Surface Water Event	Dates	Total Event Rainfall Amount (inches) ¹	Day 1 Rainfall Amount (inches)	Day 2 Rainfall Amount (inches)	Rain Duration (hours) ²	Peak Intensity (inches/hour) ³	Average Intensity (inches/hour) ⁴	Category
1	12/09/2014 – 12/10/2014	2.6	2.6	0.01	12	0.32	0.22	High intensity/long duration
2	3/14/2015 – 3/15/2015	0.76	0.76	0.0	15	0.12	0.05	Low intensity/long duration
3	4/20/2015 – 4/21/2015	1.24	0.88	0.36	15	0.29	0.08	Low intensity/long duration
4	8/11/2015 – 8/12/2015	0.75	0.75	0.0	6	0.20	0.13	High intensity/short duration
5	9/10/2015 – 9/11/2015	0.79	0.75	0.04	16	0.12	0.05	Low intensity/long duration

Notes:

1 = Rainfall amounts are the sum of precipitation over both rounds of surface water sampling taken with the field facility rain gauge.

2 = Rain duration is the sum of time of measurable rain during both rounds of sampling, rounded up to the nearest hour.

3 = Peak intensity is the maximum amount of precipitation by hour, during both rounds of sampling.

4 = Average intensity is the amount of rain divided by the duration.

Table 6-4
Summary of Degradation Rates, Diffusivity, and Henry’s Law Constants from Literature

Chemical	Molecular Weight (g/mol)	Diffusivity in Water (cm ² /s) ¹	Henry's Law Constant (J/mol) ²	Biodegradation Rate (water/sediment; half-life in days) ³
Polycyclic Aromatic Hydrocarbons				
2-Methylnaphthalene	142	8.0E-06	53	19 / 167
Acenaphthene	154	7.6E-06	19	62 / 556
Acenaphthylene	152		12	19 / 167
Anthracene	178	6.8E-06	5.6	105 / 945
Benzo(a)anthracene	228	5.7E-06	1.2	
Benzo(a)pyrene	252	5.3E-06	0.046	
Benzo(b)fluoranthene			0.067	
Benzo(g,h,i)perylene	276	5.0E-06	0.034	
Benzo(j)fluoranthene	252	5.3E-06	0.059	
Benzo(k)fluoranthene				
Chrysene	228	5.7E-06	0.53	
Dibenz(a,h)anthracene	278	5.0E-06	0.014	
Fluoranthene	202	6.2E-06	0.9	
Fluorene	166	7.2E-06	9.7	19 / 167
Indeno(1,2,3-c,d)pyrene	276	5.0E-06	0.035	105 / 945
Naphthalene	128	8.6E-06	45	62 / 556
Phenanthrene	178	6.8E-06	4.3	105 / 945
Pyrene	202	6.2E-06	1.2	
Polychlorinated Biphenyls – Homolog Groups				
Monochlorobiphenyls	189	5.7E-06	57	Literature-reported degradation rates vary significantly; assume no biodegradation in most environmental settings ⁴
Dichlorobiphenyls	223	5.4E-06	24	
Trichlorobiphenyls	258	5.2E-06	19	
Tetrachlorobiphenyls	292	4.9E-06	12	
Pentachlorobiphenyls	326	4.7E-06	6.7	
Hexachlorobiphenyls	361	4.5E-06	3.6	
Heptachlorobiphenyls	395	4.3E-06	1.9	
Octachlorobiphenyls	430	4.2E-06	1.3	
Nonachlorobiphenyls	464	4.0E-06	0.62	
Decachlorobiphenyls	499	3.9E-06	0.34	
Copper	63.5	4.2E-05	Limited volatilization in metals	Metals do not biodegrade

Notes:

1 = For PAHs – Derived from Schwarzenbach et al. (1993) molar-weight correlation. For PCBs and copper – Derived from Hayduk and Laudie (1974) molar-volume correlation; molar volume from Singman (1984).

2 = For PAHs – Henry’s Law Constant values obtained from HENRYWIN module (Experimental Database values) of USEPA’s EPI Suite (USEPA 2012).

For PCBs – All 209 PCB congener values tabulated directly from Brunner et al. (1990) or calculated from regression with number of total and ortho chlorines. Homolog group Henry’s Law Constant values (presented in this table) developed by calculating the arithmetic average of results for individual congeners within each homolog group.

3 = Biodegradation half-life values based on the BIOWIN ultimate biodegradation expert survey module (BIOWIN3 model; USEPA 2012), which provides an estimation of complete chemical biodegradation (i.e., mineralization) in relative terms (e.g., hours, hours to days, days, days to weeks). The relative timeframe results are converted to a half-life using a set of conversion factors, which consider six half-lives to constitute complete degradation (assuming first-order kinetics). The model provides two sets of conversion factors: the "USEPA default" uses values derived by the USEPA’s Office of Pollution Prevention and Toxics, and the "alternative" set uses slightly more conservative values. The latter set of values were used to derive degradation rates presented herein. The BIOWIN model assumes the rate of ultimate biodegradation in sediment (anaerobic biodegradation) is on average one-ninth of that in the water column (aerobic biodegradation). Biodegradation in a surface sediment aerobic zone could be considered to occur at a rate between the aerobic water and anaerobic sediment values.

4 = Fewer reviewed documents reported biodegradation in PCBs (as compared to PAHs) and, where reported, rates varied significantly. Due to the wide range of reported rates, no degradation will be assumed for PCBs.

Table 6-4
Summary of Degradation Rates, Diffusivity, and Henry’s Law Constants from Literature

Acronyms:
cm²/s = square centimeters per second
g/mol = grams per mole
J/mol = joules per mole
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
USEPA = U.S. Environmental Protection Agency

References:
Brunner et al. (Brunner, S., E. Hornung, H. Santl, E. Wolff, and O.G. Piringer), 1990. Henry’s Law Constants for Polychlorinated Biphenyls: Experimental Determination and Structure-Property Relationships. *Environmental Science and Technology* 24(11):1751 – 1754.
Hayduk and Laudie (Hayduk, W. and H. Laudie), 1974. Prediction of Diffusion Coefficients for Non-electrolytes in Dilute Aqueous Solutions. *AIChE Journal* 20(3):611 – 61.
Schwarzenbach et al. (Schwarzenbach, R.P., P.M. Gschwend, and D.M. Imboden), 1993. *Environmental Organic Chemistry* . New Jersey: John Wiley & Sons, Inc.
Singman, C.N., 1984. Atomic Volume and Allotropy of the Elements. *Journal of Chemical Education* 61(2):137 – 142.
USEPA (U.S. Environmental Protection Agency), 2012. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11, KOCWIN™, BIOWIN™ and HENRYWIN™ models. Available from: <https://www.epa.gov/tsca-screening-tools/epi-suite-estimation-program-interface>.

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Table 6-5
Chemical Mass Inventory and Mass Load Results

Chemical	Reach	Study Area Mass Inventory (kg)			Sources to the Study Area Annual Loads (kg/year)							Sediment/Water Exchange Processes Annual Loads (kg/year)				Subsurface/Surface Sediment Mass Transfer Processes Annual Loads (kg/year)	
		Average Mass in Surface Water ¹	Mass in Surface Sediment (top 15 cm)	Mass in Subsurface Sediment (15 cm to native material interface)	Point Sources					Atmospheric Deposition	Groundwater Entering Subsurface	Surface Porewater Advection	Surface Porewater Net Diffusive Exchange	Sediment Deposition (dry weather data) ¹	Sediment Deposition (wet weather data) ¹	Burial from Surface to Subsurface Sediment	Subsurface into Surface Sediment Porewater Advection
					Combined Sewer Overflows	WWTP Effluent Overflow	Stormwater	Groundwater Effluent	Total Point Sources								
Total PAH (17)	English Kills	0.1	480	43,000	4.9	--	4.2	--	9.1	0.71	5.3	12	35	1	2	10	18
	East Branch	0.04	120	26,000	7.5	--	3.0	--	10	0.30	0.52	0.19	1.3	1	5	20	0.27
	Maspeth Creek	0.01	120	34,000	8.2	--	1.3	--	9.5	0.20	0.19	0.069	1.2	0.3	2	5.2	0.10
	Dutch Kills	0.04	200	42,000	2.4	--	0.43	--	2.8	0.38	0.76	0.58	7.8	1	2	7.7	0.85
	Whale Creek	0.02	21	11,000	--	0.93	0.082	--	1.0	0.10	0.15	0.087	0.63	0.2	1	1.8	0.13
	CM 0 – 1	0.1	400	260,000	0.57	--	1.3	83	85	1.3	33	0.21	3.8	10	20	94	0.31
	CM 1 – 2	0.1	200	71,000	0.029	--	4.4	0.75	5.1	0.92	0.72	0.064	0.72	3	10	21	0.093
	CM 2+	0.2	930	790,000	0.35	--	5.6	--	6.0	1.2	1600	8.0	30	1	4	30	12
	Study Area	0.7	2,500	1,300,000	24	0.93	20	83	130	5.0	1700	22	80	20	50	190	31
Total PCBs	English Kills	0.01	72	7,000	0.069	--	0.13	--	0.19	0.0057	0.052	0.16	0.45	0.1	0.2	1.6	0.23
	East Branch	0.001	4.0	940	0.10	--	0.089	--	0.19	0.0024	0.0022	0.00092	0.0049	0.1	0.2	0.69	0.0013
	Maspeth Creek	0.0002	5.8	520	0.12	--	0.038	--	0.15	0.0016	0.00012	0.00021	0.0028	0.02	0.0	0.26	0.00031
	Dutch Kills	0.001	52	880	0.033	--	0.013	--	0.046	0.0031	0.00078	0.00094	0.011	0.04	0.05	2.0	0.0014
	Whale Creek	0.001	1.0	53	--	0.050	0.0024	--	0.053	0.00084	0.00052	0.00072	0.0055	0.01	0.04	0.091	0.0010
	CM 0 – 1	0.01	10	660	0.0081	--	0.040	0.00017	0.048	0.010	0.00062	0.0021	0.037	1	2	2.4	0.0031
	CM 1 – 2	0.01	7.9	760	0.00040	--	0.13	0.00050	0.13	0.0074	0.00043	0.0016	0.022	0.2	0.5	0.85	0.0024
	CM 2+	0.01	88	5,600	0.0050	--	0.17	--	0.17	0.0093	0.0044	0.064	0.22	0.1	0.2	2.9	0.092
	Study Area	0.03	240	16,000	0.34	0.050	0.61	0.00067	0.99	0.041	0.061	0.23	0.76	1	3	11	0.33
Copper	English Kills	1	5,600	520,000	55	--	49	--	100	0.36	4.0	6.3	9	20	70	120	6.0
	East Branch	1	1,000	190,000	85	--	35	--	120	0.15	0.65	0.61	0.70	40	100	180	0.58
	Maspeth Creek	0.1	1,400	390,000	93	--	15	--	110	0.10	0.26	0.068	-1.3	10	40	61	0.064
	Dutch Kills	1	1,400	150,000	27	--	5.1	--	32	0.19	0.62	0.47	1.6	20	50	54	0.45
	Whale Creek	0.4	230	32,000	--	33	0.96	--	34	0.052	0.21	0.18	0.20	7	10	20	0.17
	CM 0 – 1	4	2,100	170,000	6.5	--	16	0.22	22	0.64	0.96	1.1	-5.1	400	600	500	1.0
	CM 1 – 2	3	2,100	330,000	0.32	--	51	2.7	54	0.46	3.2	0.81	0.44	90	200	230	0.77
	CM 2+	5	31,000	2,200,000	4.0	--	66	--	70	0.58	6.6	14	19	90	300	1000	14
	Study Area	20	45,000	4,000,000	270	33	240	2.9	540	2.5	16	24	24	700	1,000	2,200	23

Notes:

Point source annual loads are presented in Section 5.1 and can be found in Tables 5-12 to 5-14.

Groundwater annual loads are presented in Section 5.2 and can be found in Table F6-2.

Atmospheric deposition annual loads are presented in Section 5.5 and can be found in Table 5-22.

Values rounded to two significant figures. Reported totals may not equal the sum of the reported individual values due to rounding.

1 = These entries are presented with one significant figure (not two) and reflects the uncertainty in averaging surface water data collected in the Study Area

Acronyms:

-- = not applicable

CM = creek mile

kg = kilogram

kg/year = kilograms per year

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

WWTP = wastewater treatment plant

Table 6-6
Supporting Information for Surface Water Mass Inventory

Reach	Acres	Average Water Depth (feet)	Volume of Surface Water (cubic meter)
English Kills	24	12	340,000
East Branch	10	11	140,000
Maspeth Creek	6.7	2.6	22,000
Dutch Kills	13	9.2	140,000
Whale Creek	3.5	18	75,000
CM 0 – 1	43	18	940,000
CM 1 – 2	31	18	710,000
CM 2+	39	16	770,000
Study Area	170	15	3,100,000

Notes:

Acreages and average water depth are calculated relative to mean sea level.

Values presented are rounded to two significant figures. Reported totals may not equal the sum of the reported individual values due to rounding.

Acronym:

CM = creek mile

Table 6-7
Supporting Information for Sediment Mass Inventory – Average Dry Density

Reach	Dry Density (pounds per cubic foot) by Depth Interval (cm)							
	0 to 15 cm	15 to 60 cm	60 to 100 cm	100 to 200 cm	200 to 300 cm	300 to 400 cm	400 to 500 cm	500 to 600 cm
English Kills	26	43	42	36	34	41	35	N/A
East Branch	19	38	35	43	42	38	44	32
Maspeth Creek	32	43	45	43	36	34	38	38
Dutch Kills	29	31	30	39	47	45	72	N/A
Whale Creek	30	25	30	36	57	36	N/A	N/A
CM 0 – 1	35	39	48	41	49	57	48	N/A
CM 1 – 2	26	31	39	47	44	84	N/A	N/A
CM 2+	23	32	36	35	42	43	44	57

Notes:

The 0- to 15-cm interval is the surface sediment; the remaining intervals (15 to 60 cm through 500 to 600 cm) are subsurface sediment.

Average dry densities are calculated using an arithmetic average of all sediment samples that were collected within the standard sampling interval and for a given reach.

Subsurface intervals are calculated using only cores that are sampled with standard sampling intervals and are continuous.

Samples collected in the native material are not included in the calculation. Entries that are designated "N/A" correspond to elevations where only native material is present.

Values presented are rounded to two significant figures.

Acronyms:

CM = creek mile

cm = centimeter

N/A = not applicable

Table 6-8
Supporting Information for Sediment Mass Inventory – Surface Area of Sediment

Reach	Surface Area of Sediment (square meters) by Depth Interval (cm)							
	0 to 15 cm	15 to 60 cm	60 to 100 cm	100 to 200 cm	200 to 300 cm	300 to 400 cm	400 to 500 cm	500 to 600 cm
English Kills	97,000	97,000	97,000	76,000	61,000	30,000	9,300	N/A
East Branch	40,000	40,000	40,000	40,000	25,000	21,000	11,000	5,500
Maspeth Creek	25,000	25,000	25,000	21,000	21,000	21,000	21,000	3,600
Dutch Kills	52,000	52,000	52,000	45,000	42,000	23,000	20,000	N/A
Whale Creek	11,000	11,000	11,000	11,000	11,000	5,900	N/A	N/A
CM 0 – 1	180,000	180,000	170,000	160,000	150,000	61,000	13,000	N/A
CM 1 – 2	120,000	120,000	120,000	100,000	41,000	11,000	N/A	N/A
CM 2+	160,000	160,000	160,000	130,000	110,000	59,000	32,000	16,000

Notes:

Surface areas are calculated using Thiessen polygons and native material depths for continuous cores that are sampled with standard sampling intervals.

Entries that are designated "N/A" correspond to elevations where only native material is present.

Values presented are rounded to two significant figures.

Acronyms:

CM = creek mile

cm = centimeter

N/A = not applicable

Table 6-9
Net Sedimentation Rates and Annual Mass Deposition Loads

Reach	Net Sedimentation Rates (centimeters per year)	Annual Net Sediment Mass Deposition Loads (metric tons per year)
English Kills	0.33	130
East Branch	2.5	310
Maspeth Creek	0.60	84
Dutch Kills	0.60	140
Whale Creek	1.0	67
CM 0 – 1	3.7	3,600
CM 1 – 2	1.5	790
CM 2+	0.50	300
Study Area	1.6	5,400

Notes:

The net sedimentation rates used for the main stem reaches are based on the 1991 to 2012 differential bathymetry analysis.

The net sedimentation rates used for English Kills, East Branch, and Maspeth Creek are based on the 1999 to 2012 differential bathymetry analysis.

The Dutch Kills net sedimentation rate is based on Pb-210 and Cs-137 geochronology core analysis.

The Whale Creek net sedimentation rate is an estimate based on net sedimentation rates observed in adjacent portions of the main stem.

Values presented are rounded to two significant figures. Reported totals may not equal the sum of the reported individual values due to rounding.

Acronyms:

CM = creek mile

Cs-137 = cesium-137

Pb-210 = lead-210

Table 6-10
Coefficient of Variation for Fish and Crab Tissue on Wet-Weight and Lipid-Normalized Basis

Chemical	Species	Prep	Reference Areas		Study Area	
			Coefficient of Variation for Wet-weight Tissue	Coefficient of Variation for Lipid-normalized Tissue	Coefficient of Variation for Wet-weight Tissue	Coefficient of Variation for Lipid-normalized Tissue
Total PCBs	Atlantic Menhaden	Whole body	0.36	0.51	0.78	0.86
	Blue Crab	Muscle and hepatopancreas	0.93	0.90	0.14	0.28
		Whole body	0.82	1.5	0.39	0.63
	Mummichog	Whole body	0.50	0.62	2.1	2.1
	Striped Bass	Fillet	0.55	1.1	0.68	0.74
		Whole body	0.49	0.66	0.41	0.51
	White Perch	Fillet	0.33	1.4	0.47	0.42

Notes:

Coefficient of variation is standard deviation divided by arithmetic average.

Totals reported using Kaplan Meier.

Values presented are rounded to two significant figures.

Acronym:

PCB = polychlorinated biphenyl

Table 7-1
BHHRA Sediment, Surface Water, Air, and Tissue COPC Summary

Chemical Name	Surface Sediment	Surface Water	Ambient Air	Tissue		
				Blue Crab	Striped Bass	White Perch
Conventional						
Cyanide	X	X	--	--	--	--
Metals						
Aluminum	X	--	--	--	--	--
Antimony	X	X	--	--	--	--
Arsenic*	X	X	--	X	X	X
Beryllium	--	Uncertain COPC	--	--		
Cadmium	X	Uncertain COPC	--	X	--	--
Chromium	X	X	--	X	X	X
Cobalt	X	Uncertain COPC	--	--	--	--
Copper	X	X	--	X	--	--
Lead	X	X	--	Uncertain COPC	Uncertain COPC	Uncertain COPC
Manganese	X	X	--	--	--	--
Mercury	X	X	--	X	X	X
Methyl mercury	--	--	--	X	X	X
Nickel	X	--	--	--	--	X
Selenium	X	--	--	X	X	X
Silver	X	Uncertain COPC	--	X	--	--
Thallium	X	Uncertain COPC	--	--	--	--
Vanadium	X	X	--	--	--	--
Zinc	X	--	--	X	--	--
Volatile Organic Compounds						
1,1,2,2-Tetrachloroethane	Uncertain COPC	Uncertain COPC	Uncertain COPC	--	--	--
1,1,2-Trichloroethane	Uncertain COPC	Uncertain COPC	Uncertain COPC	--	--	--
1,2,3-Trichlorobenzene	--	Uncertain COPC	--	--	--	--
1,2,4-Trichlorobenzene	--	Uncertain COPC	Uncertain COPC	--	--	--
1,2,4-Trimethylbenzene	--	--	X	--	--	--
1,2-Dibromo-3-chloropropane	Uncertain COPC	Uncertain COPC	--	--	--	--
1,2-Dichloroethane	Uncertain COPC	Uncertain COPC	--	--	--	--
1,2-Dichloroethene, cis-	--	X	Uncertain COPC	--	--	--
1,2-Dichloropropane	Uncertain COPC	Uncertain COPC	--	--	--	--
1,2-Dichlorotetrafluoroethane	--	--	Uncertain COPC	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)	--	--	Uncertain COPC	--	--	--
1,3-Dichlorobenzene	Uncertain COPC	Uncertain COPC	--	--	--	--
1,3-Dichloropropene, cis-	--	Uncertain COPC	--	--	--	--
1,3-Dichloropropene, trans-	--	Uncertain COPC	--	--	--	--
1,4-Dichlorobenzene	--	Uncertain COPC	--	--	--	--
2-Hexanone (Methyl butyl ketone)	--	Uncertain COPC	--	--	--	--
Benzene*	X	X	X	--	--	--
Benzyl chloride	--	--	Uncertain COPC	--	--	--
Bromodichloromethane	Uncertain COPC	Uncertain COPC	Uncertain COPC	--	--	--
Bromomethane (Methyl bromide)	Uncertain COPC	Uncertain COPC	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)	Uncertain COPC	Uncertain COPC	X	--	--	--
Chloroform	Uncertain COPC	X	X	--	--	--

Table 7-1
BHHRA Sediment, Surface Water, Air, and Tissue COPC Summary

Chemical Name	Surface Sediment	Surface Water	Ambient Air	Tissue		
				Blue Crab	Striped Bass	White Perch
Dibromochloromethane	Uncertain COPC	Uncertain COPC	--	--	--	--
Ethylbenzene	X	--	X	--	--	--
Ethylene dibromide (1,2-Dibromoethane)	Uncertain COPC	Uncertain COPC	Uncertain COPC	--	--	--
Tetrachloroethene (PCE)	--	--	X	--	--	--
Trichloroethene (TCE)*	X	X	X	--	--	--
Vinyl chloride*	X	X	X	--	--	--
Semivolatile Organics						
1,2,4,5-Tetrachlorobenzene	Uncertain COPC	Uncertain COPC	--	--	--	--
1,4-Dioxane	Uncertain COPC	Uncertain COPC	--	--	--	--
2,4,6-Trichlorophenol	Uncertain COPC	Uncertain COPC	--	--	--	--
2,4-Dinitrophenol	Uncertain COPC	Uncertain COPC	--	--	--	--
2,4-Dinitrotoluene	Uncertain COPC	Uncertain COPC	--	--	--	--
2,6-Dinitrotoluene	Uncertain COPC	Uncertain COPC	--	--	--	--
2-Chlorophenol	Uncertain COPC	--	--	--	--	--
2-Nitroaniline	Uncertain COPC	--	--	--	--	--
3,3'-Dichlorobenzidine	Uncertain COPC	Uncertain COPC	--	--	--	--
3-Nitroaniline	Uncertain COPC	Uncertain COPC	--	--	--	--
4-Chloroaniline	--	Uncertain COPC	--	--	--	--
4-Nitroaniline	Uncertain COPC	Uncertain COPC	--	--	--	--
Atrazine	Uncertain COPC	Uncertain COPC	--	--	--	--
Biphenyl (1,1'-Biphenyl)	X	Uncertain COPC	--	--	--	--
bis(2-Chloroethoxy)methane	Uncertain COPC	--	--	--	--	--
bis(2-Chloroethyl)ether	Uncertain COPC	Uncertain COPC	--	--	--	--
Bis(2-ethylhexyl)phthalate	X	X	--	--	--	--
Dimethyl phthalate	Uncertain COPC	--	--	--	--	--
Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	Uncertain COPC	Uncertain COPC	--	--	--	--
Hexachlorobenzene	--	Uncertain COPC	--	--	--	--
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	Uncertain COPC	Uncertain COPC	Uncertain COPC	--	--	--
Hexachlorocyclopentadiene	Uncertain COPC	--	--	--	--	--
Hexachloroethane	Uncertain COPC	Uncertain COPC	--	--	--	--
Nitrobenzene	Uncertain COPC	Uncertain COPC	--	--	--	--
n-Nitrosodi-n-propylamine	Uncertain COPC	Uncertain COPC	--	--	--	--
Pentachlorophenol	Uncertain COPC	Uncertain COPC	--	--	--	--
Polycyclic Aromatic Hydrocarbons						
1- Methylanthracene	X	--	--	--	--	--
2- Methylanthracene	X	--	--	--	--	--
Benzo(a)anthracene	X	X	--	--	--	Uncertain COPC
Benzo(a)pyrene	X	X	--	X	X	Uncertain COPC
Benzo(b)fluoranthene	X	X	--	--	--	Uncertain COPC
Benzo(j,k)fluoranthene	X	--	--	--	--	--
Chrysene	X	--	--	--	--	--
Dibenzo(a,h)anthracene	--	--	--	X	X	Uncertain COPC
Dibenzo(a,h)anthracene and dibenzo(a,c)anthracene	X	X	--	--	--	--
Dibenzofuran	X	Uncertain COPC	--	--	--	--

Table 7-1
BHHRA Sediment, Surface Water, Air, and Tissue COPC Summary

Chemical Name	Surface Sediment	Surface Water	Ambient Air	Tissue		
				Blue Crab	Striped Bass	White Perch
Indeno(1,2,3-c,d)pyrene	X	--	--	--	--	Uncertain COPC
Naphthalene	X	X	--	--	--	--
Phenanthrene	X	--	--	--	--	--
Pesticides						
Aldrin	X	Uncertain COPC	--	Uncertain COPC	Uncertain COPC	Uncertain COPC
4,4'-DDD (p,p'-DDD)	--	--	--	X	X	--
4,4'-DDE (p,p'-DDE)	--	--	--	X	X	--
Dieldrin	X	Uncertain COPC	--	X	X	X
Heptachlor	X	Uncertain COPC	--	Uncertain COPC	Uncertain COPC	--
Heptachlor epoxide	X	Uncertain COPC	--	X	Uncertain COPC	X
Hexachlorobenzene	--	--	--	X	X	--
Hexachlorocyclohexane (BHC), alpha-	--	Uncertain COPC	--	X	X	--
Hexachlorocyclohexane (BHC), beta-	--	--	--	--	Uncertain COPC	--
Hexachlorocyclohexane (BHC), delta-	X	X	--	X	Uncertain COPC	--
Hexachlorocyclohexane (BHC), gamma- (Lindane)	--	--	--	--	Uncertain COPC	--
Mirex	--	Uncertain COPC	--	X	Uncertain COPC	Uncertain COPC
Total chlordane	X	--	--	X	X	X
Toxaphene	Uncertain COPC	Uncertain COPC	--	--	--	--
Herbicides						
Mecoprop (MCP)	Uncertain COPC	Uncertain COPC	--	--	--	--
Mephanac (MCPA)	Uncertain COPC	Uncertain COPC	--	--	--	--
Dioxins/Furans						
Total dioxins/furans TEQ 2005 (mammal)	X	X	--	X	X	X
PCB Aroclors						
Aroclor 1221	--	--	Uncertain COPC	--	--	--
Aroclor 1242	--	--	X	--	--	--
PCB Congeners						
Total non-dioxin-like PCB congeners	--	X	--	X	X	X
Total PCB congeners TEQ 2005 (mammal)	X	X	--	X	X	X
Total PCB (Aroclor*1.75 and Congener)						
Total PCB (Aroclor*1.75 and Congener)	X	--	--	--	--	--

Notes:
* = USEPA Group A known human carcinogen
X = contaminant is a COPC
-- = contaminant not a COPC
Uncertain COPC = contaminants without an SL with an FoD > 5% or a contaminant with an FoD < 5% and an RL > SL

Acronyms:
BHHRA = Baseline Human Health Risk Assessment
COPC = contaminant of potential concern
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
FoD = frequency of detection
PCB = polychlorinated biphenyl
RL = reporting limit
SL = screening level
TEQ = toxic equivalence quotient

Exposure Point	Receptor Population	Age Class	Total Cancer Risk	Total Noncancer HI
Study Area	Recreational Boater	Adult	1E-07	1E-02
		Adolescent	1E-07	1E-02
	Swimmer/Bather	Adult	4E-08	2E-03
		Adolescent	5E-08	3E-03
	Recreational Angler – Striped Bass	Adult	2E-04	1E+01
		Adult*	2E-04	1E+01
		Adolescent	1E-04	1E+01
		Adolescent*	1E-04	1E+01
		Child	1E-04	2E+01
		Adult/Child	3E-04	N/A
Phase 2 Reference Area	Recreational Angler – Striped Bass	Adult	8E-05	4E+00
		Adolescent	5E-05	4E+00
		Child	5E-05	8E+00
		Adult/Child	1E-04	N/A
Study Area	Recreational Angler – White Perch	Adult	2E-04	1E+01
		Adult*	2E-04	1E+01
		Adolescent	1E-04	1E+01
		Adolescent*	1E-04	1E+01
		Child	1E-04	2E+01
		Adult/Child	3E-04	N/A
Phase 2 Reference Area	Recreational Angler – White Perch	Adult	1E-04	6E+00
		Adolescent	7E-05	6E+00
		Child	7E-05	1E+01
		Adult/Child	2E-04	N/A
Study Area	Recreational Crab – Blue Crab	Adult	5E-04	2E+01
		Adult*	5E-04	2E+01
		Adolescent	3E-04	2E+01
		Adolescent*	3E-04	2E+01
		Child	3E-04	4E+01
		Adult/Child	8E-04	N/A
Phase 2 Reference Area	Recreational Angler – Blue Crab	Adult	1E-04	7E+00
		Adolescent	9E-05	7E+00
		Child	8E-05	1E+01
		Adult/Child	2E-04	N/A
Study Area	Plank Road Recreational User	Adult	1E-06	3E-02
		Adolescent	2E-06	3E-02
	Shoreline Recreational User	Adult	9E-08	9E-03
		Adolescent	4E-08	7E-03
		Child	2E-08	7E-03
		Adult/Child	1E-07	N/A
	Landside Worker	Adult	2E-06	2E-01
	Dockside Worker	Adult	1E-06	2E-02
	Hunter's Point South Construction Worker	Adult	5E-07	8E-01
	General Construction Work	Adult	2E-06	2E+00
	Sailboat Users	Adult	8E-07	1E-01
	Residents – Flooding Scenario	Adult	1E-06	4E-02
		Adolescent	2E-06	5E-02
		Child	2E-06	6E-02
		Adult/Child	3E-06	N/A
	Occupational Worker – Flooding Scenario	Adult	2E-06	4E-02

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10⁻⁶ to 10⁻⁴ or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

* = Includes risks and hazards from exposure to surface water and air

Acronyms:

HI = hazard index

N/A = not applicable

RME = reasonable maximum exposure

Table 7-3
All Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
Striped Bass RME Scenario

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler – Striped Bass

Exposure Point	Age Class	BHHRA Scenario	
		Total Cancer Risk	Total Noncancer HI
Study Area	Adult	2E-04	1E+01
	Adolescent	1E-04	1E+01
	Child	1E-04	2E+01
	Adult/Child	3E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

BHHRA = Baseline Human Health Risk Assessment

N/A = not applicable

USEPA = U.S. Environmental Protection Agency

HI = hazard index

RME = reasonable maximum exposure

COPCs That Exceed the Acceptable Cancer and Noncancer Risk Thresholds

Age Class	COPCs	Exceeds Acceptable Cancer Risk Range	Exceeds Acceptable Noncancer Hazard Threshold
Adult	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Adolescent	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Child	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Adult/Child	Total Nondioxin-like PCB Congener	X	N/A
	Total PCB Congener TEQ 2005 (Mammal)	--	N/A
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	N/A

Notes:

-- = COPC not exceeding cancer or noncancer risk thresholds

COPC = contaminant of potential concern

PCB = polychlorinated biphenyl

X = COPC exceeding cancer or noncancer risk thresholds

N/A = not applicable

TEQ = toxic equivalence quotient

Table 7-4
All Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
White Perch RME Scenario

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler – White Perch

Exposure Point	Age Class	BHHRA Scenario	
		Total Cancer Risk	Total Noncancer HI
Study Area	Adult	2E-04	1E+01
	Adolescent	1E-04	1E+01
	Child	1E-04	2E+01
	Adult/Child	3E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

BHHRA = Baseline Human Health Risk Assessment

N/A = not applicable

USEPA = U.S. Environmental Protection Agency

HI = hazard index

RME = reasonable maximum exposure

COPCs That Exceed the Acceptable Cancer and Noncancer Risk Thresholds

Age Class	COPCs	Exceeds Acceptable Cancer Risk Range	Exceeds Acceptable Noncancer Hazard Threshold
Adult	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Adolescent	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Child	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--
Adult/Child	Total Nondioxin-like PCB Congener	--	N/A
	Total PCB Congener TEQ 2005 (Mammal)	--	N/A
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	N/A

Notes:

-- = COPC not exceeding cancer or noncancer risk thresholds

COPC = contaminant of potential concern

PCB = polychlorinated biphenyl

X = COPC exceeding cancer or noncancer risk thresholds

N/A = not applicable

TEQ = toxic equivalence quotient

Table 7-5
All Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
Blue Crab RME Scenario

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler – Blue Crab

Exposure Point	Age Class	BHHRA Scenario	
		Total Cancer Risk	Total Noncancer HI
Study Area	Adult	5E-04	2E+01
	Adolescent	3E-04	2E+01
	Child	3E-04	4E+01
	Adult/Child	8E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

BHHRA = Baseline Human Health Risk Assessment

N/A = not applicable

USEPA = U.S. Environmental Protection Agency

HI = hazard index

RME = reasonable maximum exposure

COPCs That Exceed the Acceptable Cancer and Noncancer Risk Thresholds

Age Class	COPCs	Exceeds Acceptable Cancer Risk Range	Exceeds Acceptable Noncancer Hazard Threshold
Adult	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	X	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	X
Adolescent	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	X	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	X
Child	Total Nondioxin-like PCB Congener	--	X
	Total PCB Congener TEQ 2005 (Mammal)	--	X
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	X
Adult/Child	Total Nondioxin-like PCB Congener	--	N/A
	Total PCB Congener TEQ 2005 (Mammal)	X	N/A
	Total Dioxin/Furan TEQ 2005 (Mammal)	X	N/A

Notes:

-- = COPC not exceeding cancer or noncancer risk thresholds

COPC = contaminant of potential concern

PCB = polychlorinated biphenyl

X = COPC exceeding cancer or noncancer risk thresholds

N/A = not applicable

TEQ = toxic equivalence quotient

Table 7-6
All Cumulative Cancer Risks and Noncancer Hazards for General Construction Worker
RME Scenario

Scenario Timeframe: Current/Future

Receptor Population: General Construction Worker

Exposure Point	Age Class	BHHRA Scenario	
		Total Cancer Risk	Total Noncancer HI
Study Area	Adult	2E-06	2E+00

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

BHHRA = Baseline Human Health Risk Assessment

HI = hazard index

RME = reasonable maximum exposure

USEPA = U.S. Environmental Protection Agency

COPCs That Exceed the Acceptable Cancer and Noncancer Risk Thresholds

Age Class	COPCs	Exceeds Acceptable Cancer Risk Range	Exceeds Acceptable Noncancer Hazard Threshold
Adult	Total Nondioxin-like PCB Congener	--	--
	Total PCB Congener TEQ 2005 (Mammal)	--	--
	Total Dioxin/Furan TEQ 2005 (Mammal)	--	--

Notes:

-- = COPC not exceeding cancer or noncancer risk thresholds

X = COPC exceeding cancer or noncancer risk thresholds

COPC = contaminant of potential concern

PCB = polychlorinated biphenyl

TEQ = toxic equivalence quotient

Table 7-7
Summary of CTE Cancer Risks and Noncancer Hazards for Study Area

Exposure Point	Receptor Population	Age Class	Total Cancer Risk	Total Noncancer HI
Study Area	Recreational Angler – Striped Bass	Adult	2E-05	2E+00
		Adult*	2E-05	2E+00
		Adolescent	6E-06	2E+00
		Adolescent*	6E-06	2E+00
		Child	7E-06	3E+00
		Adult/Child	2E-05	N/A
	Recreational Angler – White Perch	Adult	2E-05	2E+00
		Adult*	2E-05	2E+00
		Adolescent	6E-06	2E+00
		Adolescent*	6E-06	2E+00
		Child	6E-06	3E+00
		Adult/Child	2E-05	N/A
	Recreational Crabber – Blue Crab	Adult	3E-05	3E+00
		Adult*	3E-05	3E+00
		Adolescent	1E-05	3E+00
		Adolescent*	1E-05	3E+00
		Child	1E-05	5E+00
		Adult/Child	4E-05	N/A
	General Construction Worker	Adult	4E-07	7E-01

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

* = includes risks and hazards from exposure to surface water and air

Acronyms:

CTE = central tendency exposure

HI = hazard index

N/A = not applicable

Table 7-8
Comparison of Cancer Risks and Noncancer Hazards Between
Study Area and Phase 2 Reference Area for Recreational Angler/Crabber RME Scenarios

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler/Crabber

Exposure Medium	Age Class	Study Area		Phase 2 Reference Area	
		Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI
Striped Bass Fillet	Adult	2E-04	1E+01	8E-05	4E+00
	Adolescent	1E-04	1E+01	5E-05	4E+00
	Child	1E-04	2E+01	5E-05	8E+00
	Adult/Child	3E-04	N/A	1E-04	N/A
White Perch Fillet	Adult	2E-04	1E+01	1E-04	6E+00
	Adolescent	1E-04	1E+01	7E-05	6E+00
	Child	1E-04	2E+01	7E-05	1E+01
	Adult/Child	3E-04	N/A	2E-04	N/A
Blue Crab Muscle and Hepatopancreas	Adult	5E-04	2E+01	1E-04	7E+00
	Adolescent	3E-04	2E+01	9E-05	7E+00
	Child	3E-04	4E+01	8E-05	1E+01
	Adult/Child	8E-04	N/A	2E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

Acronyms:

HI = hazard index

N/A = not applicable

RME = reasonable maximum exposure

USEPA = U.S. Environmental Protection Agency

Table 7-9
Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
Striped Bass Alternative and Baseline RME Scenarios

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler – Striped Bass

Exposure Point	Age Class	BHHRA Scenario		Sportfish Advisory Scenario		FI = 0.5 Scenario	
		Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI
Study Area	Adult	2E-04	1E+01	6E-05	4E+00	1E-04	6E+00
	Adolescent	1E-04	1E+01	9E-06	4E+00	6E-05	6E+00
	Child	1E-04	2E+01	N/A	N/A	6E-05	1E+01
	Adult/Child	3E-04	N/A	N/A	N/A	2E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

Acronyms:

BHHRA = Baseline Human Health Risk Assessment

FI = fraction ingested

HI = hazard index

N/A = not applicable

RME = reasonable maximum exposure

USEPA = U.S. Environmental Protection Agency

Table 7-10
Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
White Perch Alternative and Baseline RME Scenarios

Scenario Timeframe: Current/Future

Receptor Population: Recreational Angler – White Perch

Exposure Point	Age Class	BHHRA Scenario		Sportfish Advisory Scenario		FI = 0.5 Scenario	
		Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI
Study Area	Adult	2E-04	1E+01	6E-05	3E+00	1E-04	6E+00
	Adolescent	1E-04	1E+01	9E-06	3E+00	6E-05	5E+00
	Child	1E-04	2E+01	N/A	N/A	6E-05	1E+01
	Adult/Child	3E-04	N/A	N/A	N/A	2E-04	N/A

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10^{-6} to 10^{-4} or HI greater than 1.

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

Acronyms:

BHHRA = Baseline Human Health Risk Assessment

FI = fraction ingested

HI = hazard index

N/A = not applicable

RME = reasonable maximum exposure

USEPA = U.S. Environmental Protection Agency

Table 7-11
Cumulative Cancer Risks and Noncancer Hazards for Recreational Angler
Blue Crab Alternative and Baseline RME Scenarios

Scenario Timeframe: Current/Future

Receptor Population: Recreational Crabber – Blue Crab

Exposure Point	Age Class	BHHRA Scenario ¹		Sportfish Advisory Scenario ²		FI = 0.5 Scenario ¹	
		Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI	Total Cancer Risk	Total Noncancer HI
Study Area	Adult	5E-04	2E+01	1E-05	8E-01	2E-04	1E+01
	Adolescent	3E-04	2E+01	2E-06	8E-01	2E-04	1E+01
	Child	3E-04	4E+01	N/A	N/A	1E-04	2E+01
	Adult/Child	8E-04	N/A	N/A	N/A	4E-04	--

Notes:

Bold text indicates risk above USEPA acceptable risk range of 10⁻⁶ to 10⁻⁴ or HI greater than 1.

1 = muscle and hepatopancreas

2 = muscle only

Adult/Child = combined age class to evaluate lifetime exposures from childhood to adult, including the sensitive early life stage

Acronyms:

BHHRA = Baseline Human Health Risk Assessment

FI = fraction ingested

HI = hazard index

N/A = not applicable

RME = reasonable maximum exposure

USEPA = U.S. Environmental Protection Agency

Table 7-12
Phase 2 SLERA Sediment, Surface Water, and Wildlife COPEC Summary¹

Chemical Name	Surface Sediment	Surface Water	Wildlife					
			Spotted Sandpiper	Green Heron	Black-Crowned Night Heron	Double-Crested Cormorant	Belted Kingfisher	Raccoon
Conventionals								
Cyanide	--	X	--	--	--	--	--	--
Metals								
Antimony	X	--	--	--	--	--	--	--
Arsenic	X	--	X	--	--	--	--	X
Barium	X	X	--	--	--	--	--	
Cadmium	X	Uncertain COPEC	X	--	--	--	--	--
Chromium	X	--	X	--	--	--	--	--
Copper	X	X	X	X	X	--	--	X
Lead	X	Uncertain COPEC	X	X	--	--	--	X
Mercury	X	--	--	--	--	--	--	--
Methyl mercury	--	--	--	--	--	--	X	--
Nickel	X	--	X	--	--	--	--	X
Selenium	X	--	X	X	--	--	X	X
Silver	X	Uncertain COPEC	--	--	--	--	--	--
Tin	X	--	--	--	--	--	--	--
Zinc	X	--	X	--	--	--	--	--
Volatile Organic Compounds								
Carbon disulfide	--	X	--	--	--	--	--	--
Semivolatile Organics								
Di-n-octyl phthalate	X	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	X	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons								
Total HPAH (10 of 17)	X	--	--	--	--	--	--	X
Total LPAH (7 of 17)	X	--	--	--	--	--	--	--
Total PAH (17)	X	--	--	--	--	--	--	X
Pesticides								
Aldrin	X	--	--	--	--	--	--	--
4,4'-DDD (p,p'-DDD)	X	--	--	--	--	--	--	--
4,4'-DDE (p,p'-DDE)	X	--	--	--	--	--	--	--
4,4'-DDT (p,p'-DDE)	X	--	--	--	--	--	--	--
Chlordane, alpha- (Chlordane, cis-)	X	--	--	--	--	--	--	--
Chlordane, beta- (Chlordane, trans-)	X	--	--	--	--	--	--	--
Dieldrin	X	--	--	--	--	--	--	--
Endosulfan sulfate	X	--	--	--	--	--	--	--
Endrin	X	--	--	--	--	--	--	--
Heptachlor epoxide	X	--	--	--	--	--	--	--
Total DDx	--	X	--	--	--	--	--	--
Dioxins/Furans								
Total dioxins/furans TEQ 1988 (Avian)	--	--	X	--	--	--	--	--
Total dioxins/furans TEQ 2005 (Mammalian)	--	--	--	--	--	--	--	X

Table 7-12 Phase 2 SLERA Sediment, Surface Water, and Wildlife COPEC Summary ¹								
Chemical Name	Surface Sediment	Surface Water	Wildlife					
			Spotted Sandpiper	Green Heron	Black-Crowned Night Heron	Double-Crested Cormorant	Belted Kingfisher	Raccoon
<i>PCB Congeners</i>								
Total PCB congeners	X	--	X	X	X	X	X	X
Total PCB congeners TEQ 1998 (Avian)	--	--	X	X	X	--	X	--
Total PCB congeners TEQ 2005 (Mammalian)	--	--	--	--	--	--	--	X

Notes:
1 = The Phase 2 SLERA included a tissue residue approach for fish, crabs, bivalves, and polychaetes, but no COPECs were identified.
X = Contaminant was identified as a COPEC for further evaluation in the baseline risk analyses. The results of the baseline risk analyses are summarized in Table 7-13.
-- = Contaminant was either eliminated or was not evaluated for a particular medium/receptor.
Uncertain COPEC = Contaminants for which risks are uncertain either because no screening level is available or because the reporting limit is greater than the screening level. Because the contaminants listed in this summary table are based on the sediment COPECs, not all contaminants identified as uncertain COPECs in the BERA are listed here. A complete list of uncertain COPECs is provided in BERA Tables 6-3, 8-10, 10-10, and 11-17.

Acronyms:
COPEC = contaminant of potential ecological concern
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
DDx = 2,4' and 4,4'-DDD, -DDE, -DDT
HPAH = high-molecular-weight polycyclic aromatic hydrocarbon
LPAH = low-molecular-weight polycyclic aromatic hydrocarbon
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SLERA = screening level ecological risk assessment
TEQ = toxic equivalence quotient

Table 7-13
Baseline Ecological Risk Assessment Summary

Receptor Group	Receptor	Line of Evidence	Contaminant	HQ or TU ^a	Location of Exceedances
Aquatic Plants	Macrophytes	Qualitative Evalution	Qualitative Evaluation	Qualitative Evaluation	Qualitative Evaluation
	Phytoplankton	Surface Water	None	HQ < 1	HQ < 1
Invertebrates	Zooplankton	Surface Water	None	HQ < 1	HQ < 1
	Epibenthic Invertebrates (Bivalves)	Surface Water	None	HQ < 1	HQ < 1
		Tissue Residue	None	HQ < 1	HQ < 1
	Benthic Macroinvertebrates ^b	Surface Water	None	HQ < 1	HQ < 1
		Sediment Toxicity	See Porewater and Bulk Sediment	See Porewater and Bulk Sediment	Dutch Kills, Whale Creek, Maspeth Creek, East Branch, English Kills, Turning Basin
		Porewater	Total PAH (34) ^c	TU = 0.46 to 270	Dutch Kills, Whale Creek, Maspeth Creek, East Branch, English Kills, Turning Basin
			Porewater Total SEM ^d	TU = 0.15 to 7.2	Whale Creek, Maspeth Creek, East Branch, English Kills, Turning Basin
		Bulk Sediment AVS, SEM	None	HQ < 1	HQ < 1
	Epibenthic Decapods (Blue Crab)	Tissue Residue	None	HQ < 1	HQ < 1
Fish	Fish	Surface Water	None	HQ < 1	HQ < 1
		Porewater	Total PAH (34) ^c	TU = 0.46 to 270	Dutch Kills, Whale Creek, Maspeth Creek, East Branch, English Kills, Turning Basin
			Porewater Total SEM ^d	TU = 0.15 to 7.2	Whale Creek, Maspeth Creek, East Branch, English Kills, Turning Basin
			Total PCB Congeners	TU = 0.052 to 9.4	English Kills, Turning Basin
		Tissue Residue	None	HQ < 1	HQ < 1
		Dietary-intake	Copper (Mummichog)	HQ = 1.2	Maspeth Creek, East Branch, English Kills, Turning Basin
Wildlife (Aquatic Birds)	Spotted Sandpiper	Dietary-intake	Lead	HQ = 1.6	Dutch Kills, Maspeth Creek, English Kills
			Total PCB Congeners	HQ = 1.9	Dutch Kills
	Green Heron	Dietary-intake	Total PCB Congeners	HQ = 2.3	Dutch Kills
	Black-crowned Night Heron	Dietary-intake	Total PCB Congeners	HQ = 1.7	Dutch Kills
	Belted Kingfisher	Dietary-intake	None	HQ < 1	HQ < 1
	Double-crested Cormorant	Dietary-intake	None	HQ < 1	HQ < 1
Wildlife (Mammals)	Raccoon	Dietary-intake	None	HQ < 1	HQ < 1
Amphibians and Reptiles	Amphibians and Reptiles	Qualitative Evaluation	Qualitative Evaluation	Qualitative Evaluation	Qualitative Evaluation

Notes:

a = A single HQ is calculated based on an overall 95% upper confidence limit on the mean concentration or dose for a particular receptor and exposure areas combination. TUs are calculated on a sample-by-sample basis and are therefore shown as a range.

b = The benthic macroinvertebrate risk assessment also includes an evaluation of benthic community structure as another line of evidence; however, because this line of evidence does involve calculation of HQs or TUs, it is not included in this summary table.

c = For the baseline risk analyses, porewater individual PAHs were analyzed according to Hawthorne et al. (2005, 2006). For the Phase 2 Screening Level Ecological Risk Assessment, bulk sediment individual PAHs were analyzed according to USEPA Method 8270 (see Table 7-12).

d = Porewater total SEM refers to the summation of dissolved concentrations of cadmium, copper, lead, nickel, and zinc measured in porewater.

Acronyms:

AVS = acid volatile sulfide

PAH = polycyclic aromatic hydrocarbon

SEM = simultaneously extracted metals

HQ = hazard quotient

PCB = polychlorinated biphenyl

TU = toxic unit

References:

Hawthorne et al. (Hawthorne, S.B., C.B. Grabanski, D.J. Miller, and J.P. Kreitinger), 2005. Solid-Phase Microextraction of Parent and Alkyl Polycyclic Aromatic Hydrocarbons in Milliliter Sediment Pore Water Samples and Determination of K_{DOC} Values. *Environmental Science and Technology* 39(8):2795-2803.

Hawthorne et al. (Hawthorne, S.B., D.J. Miller, and J.P. Kreitinger), 2006. Measurement of Total PAH Concentrations and Toxic Units Used for Sediment Risk Assessment at Manufactured Gas Plant Sites. *Environmental Toxicology and Chemistry* 25(1):287-296.